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EXAMINATION OF COMMERCIAL COPAIBA.

By Charles A. Bowman, Ph.G.

From an Inaugural Essay.

The author discusses the natural causes of the different appearance of commercial copaiba, which are found in its being obtained from different species of Copaifera, in the probable mixture of the products of different species, and in the loss or oxidation of the volatile oil from exposure. The principal varieties used in the United States are Maracaibo and Para copaiva, the former of which is a thicker liquid than the last. Specimens of both kinds were procured for examination from reliable houses.

Para copaiba yielded a clear solution with a small quantity of absolute alcohol and a slight flocculent precipitate with a large quantity. With little alcohol, sp. gr. ·817, a separation into two layers took place; but with a large amount no separation occurred, and the solution was nearly clear. Alcohol, sp. gr. ·835, gave in all proportions two layers, the lower of which was transparent, the upper cloudy. Agitated with half its bulk of ammonia, a perfectly clear solution was obtained. On evaporating a little from paper, a resinous spot without greasy margin was obtained, and when evaporated in a capsule 44·4 per cent. of a hard resin was left.

The Maracaibo copaibas behaved differently; they were cloudy and without flocculent separation with absolute alcohol; milky and without separation with little alcohol, sp. gr. ·817, and cloudy with more. They separated into two layers with alcohol, sp. gr. ·835, gave a permanent milky mixture with half the bulk of ammonia, left on paper a resinous stain with a greasy margin, and on evaporation from a capsule a plastic or soft residue.

The Para copaiba was then adulterated with, first, 30 per cent. of castor oil; second, the same amount of linseed oil, and, third, 20 to 50 per cent. of Venice turpentine. With these mixtures the following behavior was observed:

Tests.	*Behavior of first.*	*Second.*	*Third mixture.*
Alcohol, absolute,	Clear solution.	Clear solution.	Clear, with much alcohol flocculent.
Alcohol, sp. gr. ·817,	Slightly cloudy.	Separation; upper layer yellow	Very slight separation.
Alcohol, sp, gr. ·835,	Separation when cold.	Separation, hot or cold.	Separation, hot or cold.
Ammonia water, half bulk,	Milky with 5 per cent. oil.	Milky with 5 per cent. oil; yellowish.	Clear solution
Dropped on paper,	Greasy margin.	Yellow greasy margin.	Well defined resin stain.
Boiled with water,	Soft; with little oil, plastic residue.	Residue soft or plastic.	Hard resin.
Heat,	Odor of copaiba, then of burning fat.	Odor of copaiba and of burning fat.	Distinct turpentine odor.
Petroleum benzin, 1 to 4 parts,	Clear solution, even in presence of 2 oil to 1 copaiba	Clear.	Dense floccules with 4 parts of turpentine.
Petroleum benzin, 10 to 12 parts,	Separation, even with 10 per cent. oil.		Dense floccules with 4 parts of turpentine.

The oil separated from the first mixture indicates pretty nearly the exact amount of castor oil present, but little remaining dissolved in the benzin. The solution of Para copaiba in petroleum benzin was clear until about 8 parts of the solvent had been added, when some floccules separated; the Maracaibo balsams gave clear solutions.

Experiments were also made with acids, oxidizing agents, various chemicals and solvents, without observing any distinguishing characteristic reactions; and though I have failed, as others have before me, to find a reliable test for the purity of the different varieties of copaiba, by which the presence of all adulterations could be detected, yet I may state that petroleum benzin, properly applied, will detect the presence of Venice turpentine, and not only the presence, but also very nearly the percentage, of castor oil. (See also paper in March number, p. 131).

ANALYSIS OF COTTON ROOT BARK.

By Charles C. Drueding, Ph.G.

From an Inaugural Essay.

The analysis was partly made at the laboratory of the Philadelphia College of Pharmacy, and after a series of preliminary experiments the following course was adopted:

Five pounds of the bark were exhausted with strong alcohol. About 24 pints of a beautiful dark-red colored tincture was obtained, which was reduced by distillation to 16 pints, and precipitated with an alcoholic

solution of acetate of lead (nearly ℥viii, dissolved in about Oiiiss alcohol, were required for this purpose), leaving a light straw-colored filtrate *B*.

The precipitate was diffused in about 8 pints of alcohol, and sulphuretted hydrogen passed through it until completely decomposed. The filtrate from the lead sulphide and washings were of a very dark red color; distilled to recover the alcohol, and evaporated, a *resinous* coloring principle was left, which yielded a dark brown-red powder, resembling powdered cochineal, wholly soluble in alcohol, ether and aqueous solutions of ammonia, soda and potassa, and precipitated from the three latter by an acid. With potassium hydrate it strikes a green color; petroleum benzin seemed to dissolve only a portion of it. The resin was therefore treated with hot benzin; about 12 pints of a light yellow-colored solution was obtained which, on cooling, deposited a small quantity of a peculiar *yellow substance*, giving the same chemical reactions as the resin. I was unable, however, to obtain a sufficiently large quantity of it to thoroughly investigate it; the benzin solution, on being evaporated to one-half its bulk, did not deposit on cooling, as was expected, but remained clear. The evaporation was then continued until all the benzin was driven off; the result was about one ounce of a blackish, greasy, semi-fluid substance, which proved to be *fat*, mixed with coloring matter, and on being boiled with caustic potassa formed soap.

The filtrate and washings *B* were reduced by distillation to about 10 pints, and freed from excess of lead by sulphuretted hydrogen and filtration. The sulphide of lead obtained was dried and marked *C*.

The filtrate was distilled to recover the alcohol, and evaporated to drive off as much as possible of the acetic acid, until about three or four ounces remained. This was mixed with six ounces of water, thrown on a moist filter, and the precipitate washed. The filtrate and washings *D* were of a brownish red color, and a sweetish bitter taste; the precipitate *E* was dark greenish, semi-fluid and greasy.

D was precipitated with subacetate of lead, and the precipitate *F* washed with water. The filtrate was marked *G*. *F* was diffused in water, decomposed with sulphuretted hydrogen, and the filtrate evaporated; a dark mass was left, having a peculiar somewhat bitter and astringent taste. It was tested for tannin, and found to give a green

color with sesquichloride of iron and also produced a precipitate with solution of gelatin.

G was freed from lead by means of sulphuretted hydrogen and filtration; the resulting liquid, about two pints, was of a light yellow color; it was evaporated on a water bath to a semi-fluid consistence. Two ounces of a red colored thick syrupy liquid was the result, having a sweet taste. Trommer's test gave an abundant red precipitate, proving the presence of *glucose*.

E was separated from the water, and washed with petroleum benzin until it ceased to pass through colored; about two pints of the benzin solution were obtained, having a dark color, yielding, after evaporation, about one ounce of *fixed oil* mixed with some *coloring matter*, and forming soap on being boiled with caustic alkalies. The portion left on the filter undissolved by the benzin was of a greenish-yellow color and hard enough to be powdered; it was soluble in alcohol and found to be *chlorophyll*.

The sulphide of lead *C* was treated with hot alcohol, but besides a little sulphur nothing was dissolved.

A portion of the dregs left after exhaustion with alcohol was dried, macerated with water for 24 hours, and expressed. The expressed liquid was mucilaginous and almost tasteles; evaporated to a syrupy consistence and mixed with an equal bulk of alcohol, an abundant precipitate of *gum* and an almost tasteless solution were obtained.

Five grams of the air-dry bark were ignited in a porcelain crucible; the ashes weighed 0·3 gram, or 6 per cent., and contained potassium, sodium, calcium, magnesium, iron, sulphuric and phosphoric acids.

The organic constituents of cotton root bark are a red and a yellow resinous coloring matter, fixed oil, gum, sugar, tannin and chlorophyll.

ON THE TANNIC ACID OF GUARANA.

By Francis V. Greene, M.D., U.S.N.

Although guarana has been known in Europe since the year 1817, when it was described by Cadet de Gassicourt, it does not appear that any complete chemical analysis of the substance has as yet been made, or that the component parts have been examined with sufficient care to afford an explanation of its peculiar action on the economy, when used as a therapeutic agent.

The chemical investigations of Theodore Martius, in 1826, proved that it was not a gum-resin, as had been supposed, but a mixture of the seeds of the Paullinia sorbilis with starch, and that it contained a crystalline principle, which he styled guaranin, under the supposition that it was a new principle. The true nature of guaranin was not detected until 1840, when Berthemot and Dechastelus submitted it to an ultimate analysis, which established the fact that it was identical in composition to caffeina. Their very valuable researches on the subject ("Jour. de Pharm.," 1840, p. 578) were, however, confined to the extraction and determination of the characters of the caffeina, and they merely refer incidentally to the gum, starch, tannin and oleaginous matters which exist in the guarana. The "Journal de Pharmacie et de Chimie" (vol. xxxix, 1861, p. 291) gives an extract from a note of M. Fournier in regard to an analysis he had made of guarana; but as it is only stated that he had found gum, starch, a fixed green oil, three volatile oils, a peculiar principle not fully determined, tannate of caffeina, and free tannic acid, without any reference to the relative proportions of the different substances, or the methods that had been employed to separate them, it can hardly be said that the analysis added anything of importance to what was already known in regard to the chemical composition of guarana. It is to be regretted that M. Fournier did not communicate his methods of isolating the different constituents, as an investigation of the physiological action of the component parts in a separate state might have afforded much information in regard to the value of the preparation as a curative agent. As far as I have been able to ascertain, no later chemical investigations of guarana have been made. It is possible, however, that Dr. Peckolt, who has examined a great number of the medicinal plants of Brazil, may have re-investigated the subject and given the results in his work, "Analyses de Materia Medica Brazileira."

During an investigation lately made, with a view to the extraction of the caffeina from guarana, several of the reactions of the accompanying tannic acid were so strikingly dissimilar from those of the tannic acids in general, that I determined to isolate it and examine it carefully. For this purpose a quantity of guarana in fine powder was treated with successive portions of boiling alcohol (75 per cent.), the alcoholic solutions filtered when cold, and the alcohol driven off on a water bath. The aqueous solution was then diluted with distilled water, and a slight

excess of basic acetate of lead added, which threw down a voluminous flesh-colored precipitate. This was thoroughly washed with distilled water, decomposed by sulphuretted hydrogen gas, and the sulphide of lead removed by filtration. The filtrate, after being heated on a water bath to drive off the excess of sulphuretted hydrogen, and filtered, gave a clear solution, with a scarcely perceptible tinge of yellow. Evaporated to dryness, this solution yielded an amorphous, slightly yellow, semi-transparent, partially scaly mass, which had the peculiar taste of tannic acid. This mass dissolved very readily in alcohol, and on allowing the alcohol to evaporate spontaneously, it was still found in the amorphous condition. That it is not incapable of crystallization, however, was proved by drying a small quantity of the aqueous solution over sulphuric acid under a bell-glass, when acicular crystals, radiating from amorphous centres, were formed.

The following is a brief description of the behavior of this acid with different reagents:

With ferric salts it gives a greenish precipitate, turning to brown on standing; with ferrous salts no precipitate is produced, but the color of the liquid is changed in a short time to a dark green. The fixed alkalies give the solution a dark, reddish-brown color; with ammonia it forms a lighter brown, while with lime water it gives a grayish-brown precipitate. It gives a green precipitate with acetate of copper, which is soluble in an excess of the precipitant. It does not precipitate the neutral sulphate of copper solution, but reduces the alkaline sulphate slowly in the cold, and rapidly when heated; it also reduces nitrate of silver by the aid of heat, and decomposes auric chloride in the cold. It gives dull white precipitates with barium salts (distinction from caffetannic acid), and a white precipitate with stannous chloride. It resembles caffetannic acid in not precipitating tartrate of antimony and potassa, and by readily precipitating both cinchonia and quinia, but differs from it in precipitating gelatin from solution. Its reactions with the alkaloids and gelatin serve to distinguish it from catechuic acid. With lead acetate it gives a dull white precipitate. It quickly decolorizes the solution of permanganate of potash, and gives a dark red color with molybdate of ammonia, which is discharged by oxalic acid.

It produces white precipitates with morphia and strychnia, and with aconitina and veratria with hydrochloric acid; it does not precipitate atropia, either in neutral solution or in presence of an acid. It gives

no precipitate with salicin or santonin, but produces a bright yellow precipitate with piperina, in presence of hydrochloric acid.

As these experiments show that the tannic acid of guarana does not give reactions precisely similar to those produced by any other of the tannic acids treated with the same reagents, it is but reasonable to conclude that it differs from them somewhat in chemical composition, and it should on this account have some distinguishing appellation. It might very properly be termed *paullinitannic acid*, which would be preferable to guaranotannic, as future investigations may show the acid of *Paullinia cupana*, which is used as a diet-drink, and probably of other species, to be identical with that of the *Paullinia sorbilis*.

NOTE UPON A REACTION OF EMETIA.

By Fred. B. Power.

Toward the many reagents commonly employed for the ready recognition of the principal alkaloids, by means of which their presence and identification may be unmistakably proven, emetia seems to maintain a neutral character, and independent of its emetic properties, and of the characteristic sparing solubility of its nitrate, no reaction has been observed by means of which its presence could be readily identified in in the course of forensic analysis.

Although probably never having met with an intentional criminal application, yet in view of the frequent and extended application of ipecac root, a marked reaction of its active principle seems deserving of notice, especially as reliance upon physiological experiments might possibly lead to its confusion with veratria, which possesses equally powerful emetic properties.

Chlorinated alkalies, which were proposed some time since as a test for morphia, and the behavior of a solution of chlorinated lime toward morphia and some other alkaloids and neutral principles, more recently examined by Wellcome,[1] afford with emetia a reaction which is apparently characteristic of this body. While most of the alkaloids examined by Wellcome were found to assume a reddish coloration with a solution of chlorinated lime—and to the number of these, according to Dragendorff, may be added physostigmia—it was observed that a solution of chlorinated lime produces with emetia

[1] "American Journal of Pharmacy," vol. xlvi, No. 7, page 305–7.

a bright orange or lemon yellow coloration, and is conveniently employed by touching a trace of the alkaloid upon a porcelain plate with a drop of the alkaline solution: the reaction being much favored by the addition of a drop of acetic or other weak acid, to insure the liberation of the hypochlorous acid, upon which the reaction apparently depends, as chlorine is incapable of producing the coloration, which is permanent and may be quite indefinitely retained.

A few drops of a solution of one part of emetia in 1,000 parts of water, when evaporated to dryness and brought in contact with a drop of the alkaline solution, readily produces the coloration; and with a solution containing one part of the alkaloid in 5,000 parts of water the yellow coloration is still perceptible.

In view of the isolation of the alkaloid when mixed with complicated organic substances, it must be remembered that it is not absorbed from acid, but very readily from alkaline solutions by amylic alcohol, chloroform, benzol and petroleum benzin.

The reaction may also be employed as a means of testing the value of various species of ipecacuanha. If a gram of the root of Cephaelis ipecacuanha in fine powder, or the cortical portion therein contained, be treated according to the process described by Prof. Flückiger,[1] for the isolation of emetia, *i. e.*, mixed with a small amount of quicklime and a few drops of water, the mixture allowed to dry upon the water bath, subsequently exhausted by chloroform, and the filtrate allowed to evaporate in a capsule containing a few drops of dilute acetic acid, the nearly colorless residue thus obtained affords with the alkaline solution the characteristic coloration.

The root of Richardsonia scabra, *Lin.*, or undulated ipecacuanha, which is occasionally quoted as a source of emetia, when similarly treated, does not produce this reaction, and which may confirm the supposition already entertained, that this root is destitute of alkaloid.

ON THE FLUID EXTRACT OF JABORANDI.

By Francis V. Greene, M.D., U.S.N.

In the experiments undertaken to test the therapeutic effects of jaborandi, which was introduced to the notice of the profession in Paris in 1873, by Dr. Coutinho, of Brazil, as a powerful sialogogue

[1] "Pharmacographia," page 335.

and diaphoretic, Rabuteau, Gubler, Rolin and other physicians of that city employed the remedy in doses of from four to six grams, infused in hot water, the dregs being swallowed along with the liquid. The same plan of administration was adopted in other parts of the Continent. In England, Ringer and others prescribed a tincture representing thirty grains to the fluidrachm, which necessitated the administration of two fluidrachms, as the equivalent of the four grams used in making the infusion.

Having, in September, 1875, received from Pernambuco, Brazil, a sufficiently large supply of the leaves for an extended trial of the new drug, I determined to employ a fluid extract in the investigation I purposed making in regard to its action on the economy, and, after several failures, succeeded in making a preparation which, in every instance it was administered, produced all the effects obtained from the infusion made from a drachm of the bruised leaves. The results obtained with this fluid extract in a series of experiments, conducted mainly at the U. S. Naval and St. Joseph's Hospitals in this city, were so satisfactory and so confirmative of the experience of foreign observers, in regard to the efficacy of the jaborandi, that I communicated them to the Bureau of Medicine and Surgery, Navy Department, in the form of a report, which was subsequently published in the "Philadelphia Medical Times" of October 30th, 1875.

In the investigation pursued at St. Joseph's Hospital, I was very kindly assisted by Dr. John M. Keating, who, on entering upon his term of service as Visiting Physician of the Philadelphia Hospital, in January, 1876, immediately introduced the use of jaborandi into the wards of that institution, where its application and action have since been carefully investigated by himself and colleagues. In a late very interesting clinical lecture on the subject, which has been presented to the notice of the profession through the columns of the "Philadelphia Medical Times" of June 23d, Dr. Keating states that the conclusions arrived at are strongly in favor of jaborandi as a safe and effectual remedy in various forms of disease. In the above-mentioned hospital it has become the practice to administer the drug in the form of an infusion of the leaves, as it was found that the preparations in the market could not be depended on to produce the desired action on the skin and salivary glands. As the same complaint has been made by a number of the profession, who have not succeeded in obtaining the

proper effects of the medicine with the preparations used by them, and as I know by experience that, as far as the fluid extract is concerned, a convenient and reliable preparation can be made with very little difficulty; I deem it advisable to call attention to some points in regard to physical characters of the jaboradi leaves, which, I believe, will account for the failures that have been experienced in making the fluid extract.

On examining a leaflet of jaborandi, we find that it is coriaceous in texture, and that, in addition to a prominent mid-rib, it contains a large number of veins which, leaving the mid-rib at an angle of about 60°, run in a parallel line to within a quarter of an inch of the margin, where they anastomose. The cellular tissue, which is covered with a tough epidermis, is studded with numerous receptacles of secretion,which give the leaflets their pellucidly punctate appearance, when held up to the light. As the result of this peculiar construction, when the leaves are ground in a mill, the woody structure is readily reduced to powder or very fine fibres, while the cellular portion is merely broken up into small fragments, still covered by the epidermis. If the material be moistened in this state with the menstruum, and placed in a percolator in small quantities at a time, it will be found in packing it, that it will spring up against the fingers as soon as the pressure is removed, and if, notwithstanding this fact, the percolation is proceeded with, on the addition of more menstruum the material will separate into several portions or layers, and the operation be thus rendered a failure. To prevent this separation, I have found it to be essential to reduce the leaves to a *moderately fine* powder; but, as even in this condition the cellular tissue was not so thoroughly disentegrated as to entirely overcome the tendency to the formation of channels in the packed mass, I furthermore adopted the plan of placing a thick layer of well-washed sand on top of the cloth covering the material, and in this way succeeded in obtaining a satisfactory percolate.

The menstruum that I have used to exhaust the jaborandi leaves has invariably been a 50 per cent. alcohol, which extracts the active principle promptly, as it is quite soluble in both alcohol and water.

With the above explanation of what I consider to be the cause of the failures that have hitherto occurred, I would suggest the following formula and directions:

FLUID EXTRACT OF JABORANDI.

Take of jaborandi leaves, in moderately fine powder, . 16 troyounces.
Alcohol (50 per cent.), ... a sufficient quantity.

Moisten the powder thoroughly with the menstruum, pack in a conical glass percolator, place a layer of two inches of well-washed sand on top of the cloth covering the material, add menstruum until the liquid begins to drop from the percolator, when the lower orifice is to be closed with a cork, and the percolator, securely covered, set aside in a moderately warm place for four days. At the expiration of this time remove the cork, and add more menstruum by degrees until the material is exhausted. The first fourteen ounces of the percolate are to be reserved, and the remainder evaporated on a water bath, with constant stirring towards the close, to two fluidounces, which are to be added to the reserved portion. If the percolation and evaporation have been properly performed, the fluid extract will not require to be filtered.

As the use of sand in the manner mentioned above appears to be called for theoretically in the case of a material like jaborandi, for the reason that in furnishing the required pressure, it secures the uniform distribution of the menstruum from the surface of the material through the whole extent of the mass, which point constitutes the essence of the process of displacement, its employment might be very advantageously extended to the percolation of various other substances, where difficulty of a similar nature is experienced.

THE FILLING OF WAFER CAPSULES.

BY J. C. WHARTON.

The introduction of "wafer capsules" or "cachets de pain" may be regarded as a permanent and valuable addition to the art of pharmacy, and must meet with extended favor among the three classes of persons intended to be benefitted by them. By these classes are meant physicians, patients and pharmacists.

When first brought to notice in this section, their novelty created an unusual, perhaps an undue demand, and subsequently a very natural wane in popularity was manifest; but they are still prescribed, and fill a place that nothing else does so well.

It is often desirable to put up in them comparatively large amounts

of medicine, and to have them in as small wafers as possible. In fact, a pharmacist may gain some credit, both with physician and patient, by using the smallest size of wafers possible. I therefore write the present communication to indicate a method which, I think, will aid others, as it has done in some cases already when the plan was adopted. It is not an easy matter to *pour* a large amount of medicine in the centre of the wafer off of the end of a spatula or out of a piece of creased paper, as is often attempted, especially if the wafer is small. The consequence is that a larger size than necessary is frequently taken.

I think it worth while to state that an easy and sure method of filling them to their *utmost capacity* is, first to put the medicine into a small *cone* of paper or thin metal, and then compress the powder or other medicine slightly with the end of the finger or in any other convenient way, and afterward to invert the cone over the wafer and gently tap it if necessary, when on removing the cone the medicine will generally be found centrally located in the wafer, and nothing remain to be done but to cover it with another similar wafer, previously moistened, and finally compress the edges together. If the cone is short in proportion to the diameter of its base, the powder may be too easily dislodged and may be scattered over too much surface of the wafer. In such case the wafer may be placed on the cone before it is inverted, so as to invert both wafer and cone in one act, and thus confine the powder within the limits of the base of the cone. A little practice will insure quite a gratifying success.

It is scarcely worth telling many pharmacists that a cone can be made of paper in about two minutes by taking a round label or other paper, which should be glazed and of about one and a quarter inch diameter, cutting it in half and pasting along the straight edge or diameter of one-half, and folding it into a cone over the end of the finger, so that the straight edge shall form the junction or seam, and the paste will cause it to unite. By holding the seam together and gently warming it, the cone will soon be finished. A small wooden handle may be attached by thrusting it through the point of the cone and pasting it to the paper.

In filling the cone with the medicine, I think the best way is to press the edge of it against the tile or slab just by the powder, flattening the rim of the cone by gentle pressure, and forcing the powder into the

cone with the spatula held edgewise against the slab. After the powder is in its place a gentle pressure upon it with the finger, as before stated, will be of service in keeping it together and causing it to come out as if moulded to the form of the cone. In many cases also, the cone will retain the powder sufficiently well to be inverted without dropping it until gently tapped.

I alluded to this subject and constructed a little cone of paper at the last meeting of the American Pharmaceutical Association.

Nashville, June 29, 1877.

CORROSIVE SUBLIMATE contaminated with ARSENIC.

By Joseph Granville Smith, Ph.G.

From an Inaugural Essay.

Experiments made in the laboratory of the Philadelphia College of Pharmacy with commercial corrosive sublimate have demonstrated its frequent contamination with arsenic. This impurity, which most likely is derived from the sulphuric acid used in preparing the mercuric sulphate, from which afterwards the mercuric chloride is sublimed, is usually present in such small proportion that it is not readily recognized by treating the precipitated sulphides with sulphhydrate of ammonium; but in Marsh's apparatus or by Fleitmann's test its presence is very easily demonstrated.

For the purpose of determining the quantity of the impurity, it was endeavored to separate the two metals by boiling the corrosive sublimate with caustic potassa; but while the arsenic was completely dissolved a small portion of mercury likewise entered into solution. When the corrosive sublimate was treated with ammonia water, a portion of the arsenic was persistently retained by the white precipitate, which could not be removed by long continued washing, after which some mercury was found in the filtrate.

Resorting to the separation of the sulphides by means of ammonium sulphhydrate, and oxidizing the sulphide of arsenic to arsenic acid, the latter was estimated as arseniate of magnesium and ammonium, but the results from the same samples varied to such an extent that they are deemed unreliable. The following two methods, however, yielded figures which agreed among themselves as well as with those obtained on repeating the experiments, in each of which from 3 to 5 grams of

corrosive sublimate were used. The arsenic having been found to be present as arsenic acid, its percentage below is given as that compound; it should also be stated that several of the samples were not completely soluble in water, but left a white residue which proved to be calomel.

Determination as sulphide.—The acidulated solution was completely precipitated by sulphuretted hydrogen, the precipitate treated with ammonium sulphide, the filtrate acidulated with acetic acid, and the precipitate collected, washed, dried and weighed. It was then oxidized with nitro-muriatic acid, the separated sulphur weighed as such, while the portion dissolved was estimated as barium sulphate. The entire weight of the sulphur thus ascertained was then deducted from the weight of the precipitate by acetic acid, and the difference, being metallic arsenic, calculated to arsenic acid.

Determination as lead arseniate.—The solution was precipitated by hydrogen sulphide, the precipitate treated with ammonium sulphide and the filtrate evaporeted to dryness. The residue was oxidized with nitric acid, heated upon a sand bath until the sulphur and excess of nitric acid had evaporated, then thoroughly mixed with an excess of recently ignited pure oxide of lead, heated to dull redness, care being taken to prevent loss by decrepidation, and weighed. From this weight was deducted the previously ascertained weight of the crucible and lead oxide, the difference being the weight of the arsenic acid.

Five samples were examined for arsenic, with the following results:

Determined as	*1.*	*2.*	*3.*	*4.*	*5.*	
Sulphide, . .	·0537	·048	·032	·083	·0901	per cent. of
Lead arseniate, . .	·054	·052	·0333	·091	·0962	arsenic acid.

In some of the Southern States two qualities of corrosive sublimate are known, No. 1 being used in prescriptions, while No. 2, which is only about two-thirds the value of the other, is employed as a hemostatic, mixed with red precipitate. No assay has been made to determine their purity.

CARBOLIC ACID AS AN ANTISEPTIC.

GREENFIELD, MASS, June, 1877.

Editor American Journal of Pharmacy:

Some two months ago an amputation of the shoulder joint was performed by a surgeon of this place, and when an antiseptic ointment was called for, one containing salicylic acid was first prepared, but this proved rather unsatisfactory, as a constant burning and irritation was

experienced during its service, and it was thought best to use one of carbolic acid, which I prepared from the following formula:

℞	White wax, ...	℥i	= grams 31·1
	Lard (very best), ...	℥viii	= grams 248·8
	Carbolic acid (crystal), ...	gr.xii	= grams 0·78
	Misce.		

The lard and wax were first melted on a water bath, then adding the carbolic acid, the whole was allowed to cool under constant stirring, and applied as often as the wound was dressed, first thrice and afterwards twice a day.

It has indeed proved so satisfactory for the case it was used that I thought it worth a notice in our "Journal," as nothing else was used but just the salve, though some warm weather prevailed here during that time; and after a duration of six weeks the patient was enjoying the free air as much as any of us. It may be well to add that in very warm weather, one ounce of the lard should be exchanged for one of wax, otherwise it would be too soft for use.

Respectfully, C. F. Wish.

GLEANINGS FROM THE FOREIGN JOURNALS.

By the Editor.

Reactions of Alkaloids.—R. Goddefroy has observed the following reactions:

1. Ferric chloride dissolved in muriatic acid produces with not too diluted solutions of alkaloids in the same acid

Yellowish-red precipitates:	*Precip. soluble in excess:*	*No precipitates:*
Aconitia, piperina, strychnia, veratria.	Atropia, quinia, cinchonia.	Brucia, caffeina, morphia.

The precipitates contain one molecule of ferric chloride, combined with two molecules of the alkaloidal hydrochlorate; the quinia double salt may be obtained in small prisms by evaporating the acid solution, is freely soluble in water and alcohol, and possesses a bitter and inky taste.

2. Antimony trichloride dissolved in muriatic acid, with solutions as before,

Precipitates from rather dilute solutions:	*From concentrated solutions:*	*No precipitates:*
Aconitia, quinia, cinchonia, conia, piperina, strychnia, veratria.	Atropia, nicotina, solania.	Caffeina, morphia.

The precipitates are white (with piperina yellow), soluble in dilute muriatic acid, and decomposed by water.

3. Solution of stannous chloride, with solutions acidulated with muriatic acid:

Precipitates from dilute solutions:	*From conc. solutions:*	*No precipitate:*
Aconitia, atropia, brucia, quinia, cinchonia, codeia, conia, morphia, piperina, solania, strychnia, veratria.	Nicotina.	Caffeina.

The precipitates are white and crystalline, slightly soluble in water, less in acidulated water; the solution of caffeina with stannous chloride in muriatic acid yields, on evaporation, crystals of the double salt.—*Archiv d. Phar.*

Hydriodate and Hydrobromate of Morphia.—The former salt, whether prepared by dissolving morphia in hydriodic acid, or by double decomposition of morphia acetate and potassium iodide, according to E. Schmidt, crystallizes in long silky needles of the composition $C_{17}H_{19}NO_3HI+2H_2O$. They are sparingly soluble in cold, more readily in hot water, lose the $2H_2O$ when exposed to 100° C., and reabsorb the water again on exposure to the air.

The hydrobromate resembles the former salt in appearance, behavior and composition, the latter being $C_{17}H_{19}NO_3HBr+2H_2O$.—*Ber. d. deutsch. Chem. Ges.*, 1877, p. 194.

Citrate of Iron and Quinia.—Three samples manufactured in England, two of which were labeled "British Pharmacopœia," were found by B. H. Paul to be very deficient in quinia. The Pharmacopœia requires 16 per cent. of that alkaloid, but the yield was

Quinia,	6·80	7.08	1·69 per cent.
Other alkaloids (cinchonia, cinchonidia, etc.),	2·16	2·62	5·36 "
Total,	8·96	9·70	6·96 "

Professor Attfield corroborated the statement that an unprincipled manufacturer had been palming off the preparation as being of official strength, while it contained only about one-half the amount of alkaloid. —*Phar. Jour. and Trans.*, April 14 and 21.

On the so-called Citrate and Valerianate of Caffeina.—P. J. Haaxman repeats the statement of Hager and others that caffeina does not combine with citric acid, and that the so-called citrate of caffeina is merely the alkaloid with a little free acid adhering to it. From his experiments made with caffeina and valerianic acid he arrives at the

conclusion that they have a similar behavior, the alkaloid crystallizing from the solution, and the crystals, after having been washed with cold water, retain only a sufficient trace of the acid to impart to them a faint odor of valerian.—*Rép. de Phar.*, 1877, p. 142, from *Nieuw Tydsch. voor de phar. in Nederl.*

Separation of the Alkaloids of Hyoscyamus, Stramonium and Belladonna in Forensic Analysis.—720 grams of each of the cut leaves were mixed with flour and fat, then twice digested, at 50° C., for 24 hours, with water acidulated with hydrochloric acid, the solutions evaporated, by means of a water-bath, to a thin syrup, this mixed with three times its volume of alcohol, set aside for 24 hours, filtered and concentrated to remove the alcohol. The aqueous residue was agitated with petroleum benzin until the latter remained colorless; it was then rendered alkaline by ammonia and twice extracted with benzol, which was afterwards evaporated to recover the alkaloids. The alkaline mother-liquors were acidulated with hydrochloric acid, agitated with ether, again rendered alkaline, and exhausted with two portions of ether. The mother-waters were again similarly treated, only chloroform being substituted for the ether. The following shows the yields:

	From Benzol.	From Ether.	From Chloroform.
Hyoscyamus,	·006 gram, yellowish amorphous,	·003 gram, amorphous,	·108 gram, amorphous.
Stramonium,	·003 gram, white,	·005 gram, crystalline,	·376 gram, yellowish crystals.
Belladonna,	·003 gram, white,	·008 gram, "	·410 gram, "

On treating the mother-liquors with amylic alcohol, those of hyoscyamus only yielded traces of alkaloid. The liquids used for removing the color from the acid solutions were free from alkaloids, except chloroform, which is therefore not adapted for this purpose.—*Phar. Zeitschr. f. Russl.*, 1876, p. 641.

Hydrochlorate of pilocarpina has been employed by Dr. Zaubzer, who considers it a very valuable sialagogue and diaphoretic, the latter property being apparently somewhat inferior to that of jaborandi, over which it has the advantage of not producing nausea or emesis, nor of its administration being followed by headache or vertigo.—*Phar. Zeitung*, No. 25.

Cyclamin ($C_{20}H_{34}O_{10}$) has been the subject of investigation by Dr. L. Mutschler, who obtained it by boiling the tubers of Cyclamen europæum with alcohol of 65 to 70 per cent. and crystallizing. It is a white powder, consisting of minute globules, inodorous, of a very pun-

gent and acrid taste; the dust is sternutatory. It is probably identical with *saponin*. By heating the powder in sealed tubes, by boiling its aqueous solution, and by the influence of emulsin, yeast or dilute acids, cyclamin is split into uncrystallizable sugar and white, inodorous and tasteless *cyclamiretin*, $C_{15}H_{22}O_2$.

Primulin obtained from the roots of primula was found to be identical with cyclamin. Primula camphor obtained by distillation of the root, has a fennel or anise-like odor; its taste is at first burning, then sweetish. It is sparingly soluble in water, the solution acquiring a deep violet color with ferric chloride. Its composition is $C_{22}H_{24}O_{10}$; on boiling with potassa it yields salicylic acid and a small quantity of another acid, which is colored deep blue by ferric chloride.—*Zeitschr. Oest. Apoth. Ver.*, No. 8, from *Ann. d. Chem.*

Asparagin in Sweet Almonds.—L. Portes has obtained 30 grms. of crystallized asparagin by treating 11 kilos of almonds with 90 per cent. alcohol; by using absolute alcohol a larger proportion could be obtained.—*Jour. de Phar. et de Chim.*, Jan., 1877, p. 30.

Strophantus hispidus, D. C., or Inée, an apocynaceous plant, is used in tropical Africa as an arrow poison. E. Hardy and N. Gallois have isolated a poisonous principle, *strophantin*, of considerable toxic power, quickly causing cessation of the heart's action when injected into a frog. It was obtained from the seeds freed from the hairs, by macerating them in alcohol slightly acidulated by hydrochloric acid, evaporating, treating the extract with cold water and evaporating spontaneously. The crystals are white, soluble in water, slightly soluble in alcohol and chloroform; it contains no nitrogen and is not a glucoside. The hairs subjected to a similar treatment yielded a crystalline alkaloid, *inein*, which did not stop the movements of the heart.—*Phar. Jour. and Trans.*, March 17—*Comp. Rend.*, lxxxiv, p. 261.

The juice of the sugar cane, according to Arno Behr, contains *aconitic acid*, which was obtained from the preserved juice and from crude sugar, from the latter to the amount of 0·149 per cent. Some Cuban sugars separated from their aqueous solutions minute crystals of aconitate of calcium. Pure aconitic acid, obtained from this source and from citric acid, was found to fuse at 187 to 188° C.; the lower fusing point usually given is due to impurities.

The author found also oxalic acid in the precipitate, obtained by dis-

solving crude sugar in little water, and mixing the solution with alcohol.—*Ber. d. Chem. Ges.*, 1877, 351–355.

Arrayan of the Spanish Pharmacopœia is *Myrtus communis*, Lin., the only species of this genus indigenous to Europe. Domingo Parodi states that the *Eugenia cisplatensis* of Cambessedes is the arrayan of the Argentine Republic, and possesses all the tonic and astringent properties of the former.[1]

The same author gives also a minute description of *Eugenia Iba-viyu* (author ?), of Paraguay and Chaco, the fruit of which is edible, has a harsh and sweet taste, and contains chlorophyll, resin, volatile and fixed oil, tannin, sugar and citric and malic acids. The leaves are pellucid punctate from oil glands, and are aromatic and astringent. The bruised leaves of both the arrayan and iba-viyu are used in the form of decoction in mucous atonic discharges.—*Revista Farmac.*, Buenos-Aires, March.

Pitury; an Australian Rival to Coca.—Baron von Mueller has succeeded to obtain some leaves of the pitury, and with certainty determined them to belong to *Duboisia Hopwoodii*, F. Muell., a bush referred to the order *Solanaceæ* or *Scrophulariaceæ*, which grows sparingly in the desert scrubs, from the Darling river and Barcoo to West Australia. In a recent communication to the "Australian Medical Journal," Baron von Mueller states that the natives chew the leaves to invigorate them during their long footjourneys through the deserts, just as coca leaves are used in South America. Those living near the Barcoo travel many days' journey to obtain the precious foliage, which is broken into small fragments and carried about by them in little bags. It is also employed to excite courage in warfare.—*Phar. Jour. and Trans.*, April 28.

Constituents of Cubebs.—E. Schmidt has again examined cubeb camphor, and corroborates the correctness of his previous analysis ("Am. Jour. Phar.," 1870, p. 225). It must be regarded as a hydrate $C_{15}H_{24}.H_2O$, which is further proven by the observations of Schaer and Wyss, that on distilling oil of cubebs which has been entirely deprived of water, water is again formed, and by the decrease of H and O in

[1] The *arrayan* of Peru is likewise a myrtle, the *Myrtus arrayan*, HBK. See "Synop. Plant. Æquinoct.," vol. iii, p. 413.—EDITOR AM. JOUR. PH.

the composition of this camphor when kept for some time over sulphuric acid.

A further examination of cubebin proved the correctness of Heldt's formula $C_{30}H_{30}O_9$, and its formation from the oil may be explained by the equation $2C_{15}H_{24}+18O=9H_2O+C_{30}H_{30}O_9$.—*Br. Chem. Ges.*, p. 188–191.

Oil of cubebs, distilled by A. Oglialoro, was observed to contain two hydrocarbons, one boiling between 158° and 163°C., having the composition $C_{10}H_{16}$, the other boiling between 250° and 270°C. The latter yielded with muriatic acid a compound $C_{15}H_{24}HCl$, which crystallizes from boiling alcohol. By heating it in sealed tubes to about 175°C., the hydrocarbon $C_{15}H_{24}$ is again separated, and after purification from sodium has a density of ·9289 at 0°C., boils at 264° to 265° C., and deflects polarized light to the left. No trace of the hydrocarbon boiling at 230°, observed by Schmidt, could be obtained.—*Jour. Chem. Soc.*, Dec., 1876.

Decomposition of Oil of Turpentine by Heat.—On passing oil of turpentine slowly through a red hot iron tube, G. Schultz observed that a large quantity of incombustible gases was generated, which were not further examined by him. A black tar collected in the well-refrigerated receiver, and was found to consist of benzol, toluol, xylol, unaltered oil of turpentine, naphthalin, phenanthrene, anthracene and methylanthracene, nearly all of which compounds have been found in coal tar, and many also occur in wood tar.—*Ber. Deutsch. Chem. Ges.*, 1877, p. 113–118.

Action of Potassa upon Cuminol.—Rich. Meyer boiled cuminol with six times its quantity of alcoholic solution of potassa for 12 hours in a retort connected with a reversed cooler. On pouring the mass into water a dark-brown oil separated, which besides some resinous matter consisted mainly of cuminic acid and cuminic alcohol; the presence of cymene, which was found by others, was not observed.—*Ibid.*, p. 149–154.

Oil of Mustard.—The observation of Gerlich ("Am. Jour. Phar.," 1875, p. 567), that allyl bromide and potassium sulphocyanide produce at a low temperature allylsulphocyanide, which at a higher temperature is converted into its isomer oil of mustard, has induced E. Schmidt to study the effect of myrosin upon myronic acid at 0°C. He found that

oil of mustard is produced, but that at the same time allyl sulphocyanide is formed, which was recognized by warming the oil with alcoholic solution of potassa, acidulating and testing with ferric chloride, when an intense red coloration is produced, indicating the presence of sulphocyanide.—*Ibid.*, p. 187.

The artificial oil of mustard of commerce, according to Dr. E. Mylius, is not identical with that obtained from the seeds, as has been stated by Dr. Schacht and others. He found in a sample of 500 gms., by subjecting it to fractional distillation, ·02 per cent. hydrocyanic acid, ·8 sulphide of carbon, 92·2 allyl-mustard-oil, 4·0 polysulphides, probably allyl trysulphide, and about 3 per cent. of nitrogenated sulphur compounds, which are not volatile without decomposition. The polysulphides, more particularly, impart to the oil a very disagreeable odor. The author believes that by careful rectification on a large scale a pure colorless article might be obtained, which still could be sold below the price of the natural oil. The artificial oil seems to be obtained by the distillation of a mixture of an allylsulphate with potassium sulphocyanide.—*Arch. d. Phar.*, March, p. 207–213.

Oxalate of Cerium.—H. G. Greenish has examined six samples of this salt, and found them all to be contaminated with some lead, iron, magnesium and sulphuric acid; several, also, with chlorine and calcium, and one with aluminium. Five of the samples lost by incineration nearly the quantity (52 per cent.) required by the Pharmacopœia; the sixth lost only 32·, and a sample of German origin 44·8 per cent. One of the samples was used for estimating lanthanum and didymium, which amounted to 68·2, the cerium only to 29 per cent. of the basylous radicals. The presence of so large a proportion of the former renders it doubtful whether the therapeutic action attributed to cerium is due to that metal alone, or whether it is shared equally by the lanthanum and didymium, with which in commercial samples the cerium seems to be always combined.—*Phar. Jour. and Trans.*, May 12.

Presence of Ammonia in Bismuthi Subnitras.—W. G. Piper has observed that commercial subnitrate of bismuth usually contains small and variable quantities of ammonia, which he supposes to be derived from the action of the metallic bismuth upon the nitric acid, probably according to the equation $2Bi_2+15HNO_3=4Bi_3NO_3+6H_2O+NH_3+N_2O_3$.

In four samples the quantity of ammonia varied between ·008 and ·076 per cent.—*Ibid.*, April 21.

Glycerite of tragacanth, as an excepient for pill masses, has been experimented with by J. C. Thresh. The glycerite was made by mixing 3 drachms of powdered tragacanth with 6 drachms of glycerin until smooth, and then adding 6 drachms of water. No material difference was observed by changing the proportions to glycerin 9 drachms and water 4 drachms. In most cases a pill mass was obtained which rolled well and had a good consistency after having been kept for six months. The pills made with this glycerite, on being macerated in water with occasional agitation, were found to swell considerably, coloring the water but slightly, and retaining their form for several hours.—*Ibid.*, March 24.

CULTIVATION of MEDICINAL PLANTS at BANBURY.

By E. M. Holmes, F.L.S.,
Curator of the Museum of the Pharmaceutical Society.

The principal farmer of medicinal plants in the neighborhood of Banbury is Mr. Usher, of Bodicote, a small village about two miles from the town. At present he has about sixty-five acres under cultivation, twenty of which are devoted to rhubarb, forty to henbane, and four or five only to the white poppy. He has also lately commenced the cultivation of *Rosa gallica*, L., on a small scale.

On a recent visit to Banbury much interesting information was kindly given me by Mr. Usher, and as it was the result of observations which had been made by that gentleman during the course of many years it seems very desirable that it should be placed upon record.

Rhubarb.—The history of the cultivation of this plant in this district has been briefly sketched by Hanbury in "Pharmacographia." In that work he attributes the plant cultivated at Banbury to *Rheum Rhaponticum*, L. It, however, more closely resembles *R. undulatum*, L., differing chiefly from the description of that plant, as given by Meisner, in the upper leaves being distinctly stalked. From *R. Rhaponticum* it differs in all the leaves being longer than broad and minutely ciliate at the margins, and in the petiole being distinctly channelled on its upper surface above the middle, although it becomes flat near the base.

The leaves have two or three somewhat triangular teeth near the point and the petioles and stem are slightly furrowed, and the ochreæ

do not appear to be deciduous as in *R. undulatum*. It would thus appear to be a hybrid between the two if indeed the two species are really distinct.

When in blossom the panicle is at first deecidedly spreading, so much so as to present an appearance totally different to that it offers at a later stage, when its branches become quite erect. Indeed, had I not found the two stages proceeding from the same root, I could hardly have believed that there were not two species growing in the same field. On closer inspection, however, the character, leaves and leaf-stalks convinced me that only one species was present.

The soil on which the plant is chiefly cultivated is a rich red friable loam, which appears to suit it well, although in some spots where the soil is damp the root decays and the plants gradually disappear. Mr. Usher's experience with regard to this plant is as follows: Up to three or four years of age the plants flower rather freely, but after that time they rarely produce inflorescence. Singularly enough, for many years past no fruit has been ripened, the little that is formed falling off soon after "setting," so that it would seem as if the plant had already acquired a tendency to become a root-producing rather than a fruit-yielding form.

The rhubarb plant does not appear to be much attacked by insects or by fungi. After about eight or nine years the soil becomes exhausted, and rotation of crops becomes necessary. The exhaustion of the soil is, however, in some degree counterbalanced by the matter returned to it by the leaves, which are allowed to decay on the ground, and even those which are taken up with the root are afterwards returned in the form of manure.

The young plants are not obtained from seed, but are always propagated from the lateral shoots of plants about four years old, at which period the shoots are more vigorous and produce finer plants than if obtained from older ones. The petioles are never gathered for food, because it has been found that so doing injures the size and quality of the root. The young plants are set at distances of three feet apart, and the root is not fit for collecting until the plants are about four years old. From that period up to nine or ten years of age the root improves in size and quality. Plants of different ages are of course cultivated in different fields so as to secure a succession of harvests each year. Plants

of about four years old yield from one and a half to two tons of dried root per acre, but ten year old plants will yield about five tons per acre.

The drying is by no means an easy task. The roots are dug up in hot weather, at any time between July and October, and for the first fortnight are exposed to a current of air on wicker baskets in a covered shed. They are then removed to the drying-room, where they are dried gradually but thoroughly for about six weeks, by means of a current of heated air. This part of the process requires great care; lest the outer portion should be dried too rapidly, while the interior is still moist. The large central portion, or tap root, furnishes the pieces known in trade as "fine large flats" and "fine large rounds." The "small rounds" and the cuttings commonly known as English "stick" rhubarb are obtained from the side branches of the root. Some of the flat pieces, except for their shrunken exterior, are not unlike the East India rhubarb of commerce, and being more thoroughly dried right through and harder in the centre seem to meet with a greater demand than the rounds. The raspings obtained in trimming the pieces are ground into powder. The average yield of the dried root every year is from eight to ten tons.

Of the *Rheum officinale*, Mr. Usher has now under cultivation in his garden about forty large plants between two and three years old, as well as about 200 seedlings. These plants are truly magnificent, each plant occupying a space from eight to twelve feet square, and standing four or five feet high. Some of the leaves are nearly three feet broad, and longer than they are broad. It is just suitable as an ornamental plant for lawns, where it would have plenty of room to grow. Indeed it is already used in this way in some of the public gradens in Paris.

The root of only one plant has as yet been dried, and was obtained from a plant barely two years old. A piece of this root has been presented to the museum of the Pharmaceutical Society, the remaining having been almost all sent to the Philadelphia Exhibition, where it obtained a medal, and was purchased.

In color, the dried root is paler, although the veins are darker, than in the East Indian rhubarb. Mr. Usher informs me that it nevertheless yield a bright yellow powder. The external markings do not exactly correspond with those of the East India rhubarb, the peculiar reticulated appearance characteristic of that sort not being visible on the two pieces that I have seen. This may, however, be due to the

age of the root, which was less than two years old. It yet remains to be seen whether the root differs when older, or whether some portions present a different aspect to others. These points I hope to have an opportunity of investigating a little latter on, when Mr. Usher will dig up some larger roots. Towards the close of the year he will probably have sufficient of the dried root of this species to be available for therapeutic purposes, and it will then only remain to ascertain whether its purgative properties are equal to those of the foreign rhubarb, which after all will be the test of its acceptance with the medical profession. A chemist at Banbury has prepared some simple tincture from the trimmings of the root, in the proportion of two ounces to the pint of proof spirit, and has found it an effectual purgative in ounce doses.

Henbane.—Doubtless many of the readers of this Journal have often wondered at the high price of biennial henbane. The information which Mr. Usher has kindly furnished will probably throw considerable light upon this point.

The biennial plant is the only one cultivated at Banbury, it being found that the presence of the annual plant tends to deteriorate the biennial variety. With regard to the difference between the two plants, Hanbury says there is scarcely any distinctive character, except that the one is annual and the other perennial. There is, however, something very distinctive in habit. The biennial plant grows to the height of two or three feet, and is abuandantly branched, and the stem is often nearly an inch thick at the base. At a distance, a field of biennial henbane looks like a field full of thistles, so much so, that Mr. Usher has occasionally heard the remark from farmers passing by, "That is bad farming, look at those thistles." This curious appearance is owing to the leaves being deeply cut, in fact almost pinnatifid. The chief difference in the leaves of the two varieties is, that in the biennial plant the leaves are about twice as long as in the annual one, and deeply cut, and the terminal lobe of the leaf is long and rather narrow.

The leaves of the upper branches, however, resemble when young those of the annual variety, being shorter and having the top of the leaf much broader, and more triangular, not lanceolate as in the stem leaves.

The seed of the biennial plant is sown in May or June, and either appears in a few days or not for several years. Mr. Usher informed

me that in one field sown with henbane none of the seed came up and the field was again sown with other crops, and it was not until nine years afterwards, during which period the field had been several times ploughed, that it yielded a good crop of hanbane quiet unexpectedly, and without any more henbane seed having been sown. This uncertainty seems to depend upon the weather being dry soon after the seed is sown. If the weather is damp immediately after sowing the seed, it usually comes up at once.

The cultivation of the plant is beset with difficulties. In the first place, it grows very slowly when young, and is soon hidden by weeds of more luxuriant growth, so that it has been found necessary to mix some rapidly growing plant, such as mustard, with it in order to indicate where it is sown. It also requires shelter when young. This difficulty Mr. Usher has obviated by sowing it in rows between beans so that it may be protected in its early stage. As soon as the young leaves are fully formed the turnip fly attacks them; when the autumn leaves of the first year have decayed a white slug eats away the central bud; and if it still manages to live a wire worm attacks the root during the winter. It will be easily understood, therefore, why the fields of henbane often present very large bare patches, and why the price of the drug is so high. The plants are collected for drying about the third week in June. The upper leaves are deprived of the midrib, and these as well as the flowering tops are dried, and form the best biennial henbane of commerce. The lower eaves and stems are used for preparing extract, for which purpose they are crushed under an edge runner, and the juice squeezed out by hydraulic pressure and then evaporated down to a proper consistence. It is obvious that an extract prepared in this way on the spot by the grower is likely to be better than when prepared from the herb sent to a distance by rail, for these plants become heated in twenty-four hours when packed closely. The leaves and flowering tops are dried in malt kilns, of which seven are in use at once. The leaves are spread thinly at first and are turned over about three times a day, and as they become somewhat dry are collected closer together into rows or heaps on the kiln floor. As one lot becomes partially dried it is removed to another kiln until quite dry, which usually happens in about three days, and a fresh lot takes its place.

There are one or two points with regard to the flower which are

rather interesting. The flowers are proterogynous, the stigma becoming mature and viscid before the anthers open, and the stigma and nearly half the style are protruded beyond the unopened flower bud. The corolla is more deeply divided in its lower half than elsewhere, and the stamens and pistil are depressed towards this portion, so that insects visiting the flower for nectar must pitch upon the stamens and receive the pollen upon their legs or abdomens, and must thus almost of necessity convey it to the protruded stigma of the unopened flower. When the corolla is fully grown it exceeds the stigma, so that the style does not appear to grow in proportion to the corolla. The anthers are furnished with a curious connective of a narrowly triangular form into which the filament tapers. As soon as the anther bursts it becomes bent backwards away from the stigma and towards the ovary as if to prevent the pollen from falling on the stigma of the same flower. Mr. Usher informs me that the annual variety does not possess a long protruded style, but as he had no plants growing I was unable to verify this observation. It would be interesting to ascertain if the henbane is dimorphic, and if the annual plant is the second form. Another interesting point of inquiry is whether the plant possesses the power of digesting the multitude of minute insects which late in the season are caught by the clammy glandular hairs. The frequent occurrence of henbane on manure heaps or places in which insects are abundant seems almost to point to such a property.

White Poppy.—The culture of this plant is attended with so much trouble and expense that it scarcely repays the labor expended on it. The seed has to be selected very carefully, for singularly enough the poppy shows a constant tendency to "sport," and if left to itself, the flowers of the white poppy become colored in a few generations; the size of the capsule decreases, and the color of the seeds and of the flowers becomes darker in proportion, until at length the flowers become purplish black, and the seeds quite black. Mr. Usher accounts for this fact by supposing that insects carry the pollen from the wild red poppy (*Papaver Rhœas*, L.) to the white one.

In order to get large capsules, only the very whitest seeds are retained and sown. Those poppies which have dark flowers, he states, produce darker colored somewhat oblong capsules. The German poppy seed produces a large capsule much flattened at the top and bottom, and with the carpels strongly convex and prominent so as to

have much the appearance of a peeled orange, or of the capsule of *Papaver hybridum*, L. This variety is not, however, readily accepted in commerce.

The seeds of the white poppy are sown in rows about 20 inches apart. When young the plants require constant weeding. The capsule, when the flower has fallen, is about the size of a walnut, and is stated by Mr. Usher to grow to the size of an orange in the short space of ten days, although it takes nearly five weeks to ripen. Each plant bears about two or three capsules. The harvest is collected during the last week in August or the first in September. A wagon load of the capsules is placed on the floor of each of the kilns and forms a layer about a yard deep, the whole of which becomes dry in about twelve hours, and is then ready for sale.—*Phar. Jour. and Trans.*, June 16.

SOME METHODS OF ESTIMATING TANNINS.[1]

By H. R. Proctor, F.C.S.

There are few substances of equal importance to the tannins, of which the chemistry is in so unsettled a state. This is, no doubt, primarily due to their complexity and unstable character, which makes their investigation one of great difficulty; and, secondarily, to the indifference and ignorance of chemistry of those to whom the knowledge is of commercial importance. But tanners may be well excused for some distrust of chemical analyses when we consider the discordant results which are yielded by most of the processes in use. With a view to exhibit the relative merits of these processes, I have ventured to give the results of comparative experiments undertaken to test their accuracy, and to point out, if possible, those which merit confidence.

The process which has been brought most prominently before the public of late is that of Muntz and Ramspacher, which consists in forcing a tannin infusion through a piece of raw hide, taking the sp. gr. before and after, and calculating the tannin from the loss. In a paper which I communicated to this Society some little time since (Proceedings, III, 213), I pointed out that the raw hide not only absorbed the tannin, but also a large proportion of the free acids in the infusion, thus, in some cases, causing a notable error. To this I may now add

[1] From the Transactions of the Newcastle-upon-Tyne Chemical Society, 1874–1877.

that it is extremely difficult to absorb the whole of the tannin, that the first portion of liquor which passes is invariably lighter than succeeding portions, and that the sources of error are so large in proportion to the quantities to be measured, that the results are of little practical value. In proof of this, I may mention that a series of nine analyses of the same sumach, well mixed, and kept in a tightly-corked bottle, gave results varying from 18 to 28 per cent., and a mean error for each single experiment of 3·15 per cent., or upwards of 13 per cent. of the total tannin, while the mean value—23·9 per cent.—was probably itself too high. In these analyses the utmost care was taken, and in each case the absence of tannin in the filtrate was proved by gelatin. If we assume that tannin is worth 20s. per ton per cent., which is not far from the truth, the chemical valuation of this sumach would vary from £18 to £28 per ton, with an average error of £3 3s., and obviously is far more erroneous than the merest guess. If any further proof of the inaccuracy of the method is needed, I may quote the results of a series of twelve analyses of a valonia by Mr. W. N. Evans, who, perhaps, has had more practice with the tan-tester than any other man in England. The average error exceeds ten per cent. of the whole quantity of tannin, and the money values vary from, say, £17 5s. to £28 10s. per ton.

The older method of Hammer, in which absorption by hide raspings takes the place of the raw hide-filter, is in my experience still more inaccurate; and I cannot say that the slight modifications proposed by Nickerson are any improvement.

Another method which has long been in use is precipitation by volumetric solution of gelatin and alum. With a solution of five grms. of gelatin per litre I found it impossible to say whether tannin or gelatin was in excess, with less differences than about 4 per cent. of the total quantity employed, and then the reactions were somewhat doubtful. These experiments were made with pure tannin; with catechu or gambier the uncertainty would be far wider, and with used tan-liquors it would be worse still. Under favorable circumstances and with great patience it is possible to obtain rough estimates by this method; but this is all I can say.

Concerning Sir H. Davy's still older method of precipitating with gelatin, filtering, drying, and weighing, and reckoning four-tenths of the whole as pure tannin, Dr. J. Watts says ("Phar. Jour." viii., 517) it

has "been shown to be both tedious and incorrect, as the solution refuses to filter, and the first portions precipitated contain a far larger proportion of tannin than do those which fall towards the end." Other chemists make the same statements, so that I had not thought it necessary to repeat their experiments. Very recently, however, I have learnt that Mr. Stoddart, of Bristol, and Mr. Dearden, of Bury, are again employing the plan, using sufficient alum to make the precipitate coagulate, and washing by decantation with boiling water. Mr. Stoddart informs me that the results agree fairly with a modification of Allen's lead method, which he employs. I therefore purpose trying it at a future time; but the results can scarcely be very accurate, and it is improbable that all tannins combine with gelatin in the same proportions. This last objection is technically of less importance, however, since the power of precipitating gelatin is probably somewhat proportionate to that of making leather.

Some years ago Fleck announced a method depending on the fact that while tannin, gallic acid, and coloring matter are all precipitated by cupric acetate solution, the two latter are redissolved by ammonic carbonate. He proposed, therefore, to employ a standard copper solution, and to estimate the excess by potassic cyanide. Dr. Watts showed that this was impracticable (owing to the fact, as I found, that cupric ammonio-gallate is not blue but brown), but that gravimetrically some tannins might be estimated with considerable accuracy, while others gave precipitates more or less soluble in the ammonic carbonate. The precipitate is complicated, and contains ammonia. Schiff gives its formula in the case of digallic acid as $C_{14}H_4Cu_2(NH_4)_2O_9+OH_2$ ("Ann. Ch. und Ph." clxxvi. 171), which would give 1 gram of tannin (digallic acid)=1·54 gram precipitate, and ·494 gram CuO. Watts, employing the number 1·489 (deduced from the assumption, now shown to be incorrect, that the salt was a simple cupric tannate), obtained analytical results fairly agreeing with those by gelatin for valonia, sumach, divi, oak bark, galls and myrobalans; and also for mimosa, by employing the number ·2959 instead of ·489. All tannins giving green precipitates with iron gave copper precipitates more or less soluble in ammonia.

No doubt this method, reckoning the tannin as two-thirds the weight of precipitate, or twice that of cupric oxide left on ignition, would give fair technical results; but it is unlikely that all the various tannins

actually combine with copper in the same proportions. In fact, as we shall see later on, the different tannins differ notably in their properties and reactions, only agreeing in their power of precipitating gelatin, and I fear tanners will have to give up all hope of measuring them by one common standard. Indeed, to a chemist, to do so seems about as reasonable as to compare the values of nitric and sulphuric acids by a standard solution of hydrochloric acid. Probably the differences between gallotannic, quercitannic and catechutannic acids are quite as great as those of the mineral acids I have named. Chemists may fairly undertake to compare sumach with sumach, or bark with bark, but the relative values of the tannins of bark and sumach are commercial matters which no analysis can decide, though it doubtless might be done by carefully conducted technical experiments.

The disadvantages of the copper method are that it is slow, troublesome and difficult, and that the washing and drying must be rapidly and carefully done, as the precipitate is easily decomposed. This difficulty might be overcome by igniting and weighing the CuO, but this can only be done easily in oxygen, as otherwise the copper is so much reduced that it is apt to deflagrate with nitric acid or ammonic nitrate. I think the best way is to filter on a vacuum filter, and dry in an air-bath (with a thermostat) at 100°.

The mean error of such result in a series of eight analyses of commercially "*pure*" tannin, containing apparently about 85 per cent. digallic acid by the total employed, was only $\pm$ 4·2 per cent., a much better approximation than any of the foregoing. It is not likely that the results with tanning materials would be quite so good. Analyses of bark showed considerable divergence, and combustion of the precipitate proved that it was somewhat inconstant in composition, the Cu varying from 21·6 to 25·4 per cent. I fancy, too, that for oak bark tannin two-thirds of the weight of precipitate is decidedly too high an estimate. It must also be borne in mind that if lime be present, as is often the case with tanyard liquors, it will be precipitated as carbonate. This might be prevented by filtering off the precipitate before washing with ammonic carbonate; but the method is troublesome enough without this, besides being of rather questionable accuracy.

Another process which has been much recommended is Mr. A. H. Allen's volumetric one, with a standard solution of acetate of lead, using as an indicator a mixture of ammonia and potassic ferricyanide.

This is described in the last edition of Sutton, but in its original form is quite inadmissible, since lead precipitates gallic acid as well as tannin, and both react equally on the indicator. In combination with some of the differential processes in which the tannin is removed by gelatin or hide raspings, it may no doubt give useful results, and as the lead compounds of the different tannins are better known than most others, possibly factors might be calculated to give percentage results. I cannot insist too strongly that any calculation of percentages by comparison with "pure" tannin is utterly fallacious, both because the various tannins are of totally different constitution, and because really pure tannin is quite unattainable. That met with in commerce only contains 80 to 90 per cent. of really pure tannin, and is very variable.

Mr. Stoddart uses Mr. Allen's process in conjunction with absorption of tannin with hide raspings, when of course the loss is *proportional* to the tannin. He also employs Nelson's gelatin swollen in cold water as an absorbent in the same manner. Time and patience are necessary for the absorption of tannin thus, and it is seldom so complete that the results are not altered by prolonged digestion. In my experience the end-reaction of Allen's method is not very distinct, and it is necessary carefully to filter the drops tested, as the indicator is affected by the precipitate. This makes the process somewhat tedious.

The remaining methods which I shall describe are all based on the oxidation of tannin by various agents, and all involve double analyses after absorption of the tannin, as tannin and gallic acid are almost identical in their behavior with oxidizers.

Mittenzwey, and afterwards Terreil, proposed to estimate it by the direct absorption of atmospheric oxygen in alkaline solution—a difficult and tedious proceeding, though doubtless capable of some accuracy in skillful hands.

Monnier proposed to determine with permanganate direct, but this proved quite impracticable, since the oxidation is rapid at first, and then slow and with *no* definite termination.

To Dr. Löwenthal is due the capital improvement, which, with his recent additions, constitutes to my mind the most practical method of tannin analysis yet discovered. He adds to the *very* dilute tannin infusion a considerable quantity of indigo, not only to act as an indicator, but to control the oxidation of the tannin. This reaction is both rapid and accurate, and, combined with his process of precipitation by gelatin,

will give results strictly comparative for any single tanning material. As it is likely to be of great practical importance, I venture to give working details, referring for further particulars to Löwenthal's paper in the "Zeitschrift für Analytische Chemie" (1877, p. 33), and to an excellent paper by Neubauer abstracted in the "C. S. Journal" (ix, 595).

Of solutions the following are required:

1.—4 grams pure permanganate of potash in 3 liters of distilled water (or ½ decinormal answers well and saves calculation).

2.—5 grams of *pure* "precipitated indigo" in 1 liter of water.

3.—Dilute sulphuric acid (1 to 3 of water).

4.—25 grams of good transparent glue, well swollen in cold water, and then dissolved by the aid of heat. The solution is made up to a liter, and saturated with pure salt (table salt).

5.—A saturated solution of pure salt, containing 25 cc. of sulphuric or 50 cc. of hydrochloric acid per liter.

To make an analysis, 10 grams of sumach or valonia, or 20–25 of bark are exhausted by repeated boiling with portions of water, and the infusion, when cold, made up to 1 liter.

Of this infusion, 10 cc. are mixed with, say three-quarter liter of good drinking water, 25 cc. of the indigo solution, and 10 cc. of the dilute sulphuric acid are added, and then the permanganate solution is run in drop by drop from the burette, with constant stirring, till the deep blue of the indigo changes to a clear yellow, and the moment this takes place we note the quantity of permanganate used. We will call this quantity A.

Next we repeat exactly the same process with the indigo and sulphuric acid alone, and will call the quantity B. Then, subtracting B from A, we obtain the amount of permanganate consumed by the total astringents of 10 cc. of our tannin infusion. The permanganate acts, of course, as an oxidizing agent, oxidizing and consuming both the tannin and the indigo; but as the tannin is the most readily oxidized of the two, it is consumed first, and when the indigo is all bleached we may be sure that the tannin is destroyed also. In order, however, to obtain this satisfactorily, the proportion of indigo should be such as to require about twice the quantity of permanganate which would be consumed by the tannin alone. Thus, if the indigo alone requires 10 cc. of permanganate to decolorize it, the indigo and tannin infusion together must not take more than about 15 cc., and if it does so, the tannin infusion must be diluted accordingly, or a less quantity employed.

The next step is to ascertain the proportion of gallic acid and impurities in our sample. To this end we mix 100 cc. with 50 cc. of our salted gelatin solution, and then, after well stirring, add 100 cc. of the salt and acid solution, and leave the mixture standing for some hours or all night, and then filter it through paper. The filtrate should be completely clear.

If we now test, say 50 cc. of this filtrate with permanganate and indigo as before, we shall obtain the amount of permanganate required for the gallic acid and impurities alone, since the tannin has been entirely precipitated, and the gelatin has so trifling an action on the permanganate that it may be safely neglected. To make the working clearer, we will take an example from Dr. Löwenthal's paper:

10 grams of sumach were boiled in three-quarters liter of water, and after cooling were made up to 1 liter.

(1) 10 cc. sumach infusion 25 cc. indigo solution	consumed 16·6 cc. permanganate.	
Do. repeated,	16·5	"
	33·1	"
50 cc. indigo alone,	13·2	"
Total permanganate for 20 cc. sumach,	19·9	"
(2) 50 cc. filtrate from the gelatin 25 cc. indigo solution	consumed 11·2 cc. permanganate.	
Do. repeated,	11·1	"
	22·3	"
50 cc. indigo alone,	13·2	"
Gallic acid and impurities,	9·1	"

Now, deducting 9·1 cc. from 19·9 cc., we have 10·8 cc. as the permanganate equivalent to the tannin of 20 cc. of sumach infusion, or 0·2 gram of dry sumach. If it be desired to compare two sumachs, these proportional numbers are all that is necessary, and indeed it will be quite safe to use them for comparing sumach with galls or pure tannin. In the same way bark may be compared with bark, and valonia with valonia, but it will not be safe to attempt by this means to compare bark with sumach or with valonia, because the different species of tannin consume different proportions of permanganate. Oser states that 1½ gram of oak-bark tannin consumes only the same quantity as 1 gram of gall-nut tannin.

I may remark that where many analyses have to be performed, the

constant stirring becomes very tedious, and a stream of air-bubbles forced through the liquid by an aspirator may be substituted with great advantage.

Neubauer reckons one liter of decinormal permanganate as equal to 4·157 grams of gallotannic acid, and consequently (according to Oser) to 6·235 of oak bark tannin. Further research, however, is needed before percentages can be calculated with certainty, and chemists, in giving results, would do well to state the equivalent in permanganate, or to say that they use Neubauer's or Oser's equivalent. The first is applicable to sumach, galls and myrobalans, the second probably to oak bark, valonia and chestnut extract, at least approximately. It is a singular fact that gallic acid consumes not only a larger proportion of permanganate, weight for weight, than tannin, but even a larger proportion than the tannin from which it is derived, as I proved by digesting a solution of tannin with dilute sulphuric acid, when its reducing power was notably increased. Hence, commercial tannin, which is largely contaminated with gallic acid, consumes more permanganate than the above-mentioned quantity.

As to accuracy, single tests should never differ by more than 0·1 cc., or say 2½ per cent. of the total quantity, but, of course, in so rapid a process, no one would rely on single tests, and by repeating and taking the mean any required accuracy may be attained. Separate portions of liquor precipitated by gelatin give identical results, at least within the limits named.

I should perhaps mention that Mr. Estcourt proposed some time since to precipitate with gelatin in conjunction with the permanganate method ("Chemical News," xxix, 110), but as he heated the solution, and tannate of gelatin is soluble in hot gelatin solution, the results were not satisfactory. Still he undoubtedly deserves the credit of the idea, while Löwenthal's cold gelatin solution, with the addition of salt and acid, completely overcomes the difficulty.

Several other oxidizing methods have been proposed. Carpeni precipitates the tannin with ammonio-acetate of zinc, redissolves and estimates with permanganate. M. Jean oxidizes with iodine in solution of sodic carbonate, and M. Pouchet with concentrated permanganate in a caustic potash solution. None of these methods seem to have any advantage over Löwenthal's, while the two latter are in my experience decidedly inferior. The end-reactions are much less distinct,

and it is quite impossible to work them by artificial light, which is almost preferable with the indigo process, and is often a great convenience.

In speaking of the results I have obtained as a test of the accuracy of methods, I do not mean to convey that they are the best attainable, but simply such as would be likely to be obtained by a chemist of average skill and experience.—*Phar. Jour. and Trans.*, June 16, 1877.

VARIETIES.

Milk-Beer.—A. Chevallier has discussed the subject of beer in general, and its importance as a question of public hygiene. He considers beer a very useful drink, containing many of the salts of nutrition, besides nitrogenous substances, easily assimilable, and especially an abundance of the elements that support respiration. After referring to the frequent adulteration of beer he speaks of this new product, *bière de lait*, as one destined to occupy an important place in alimentary hygiene; its manufacture rests on the same principle as that of other beer, except that milk is used instead of water in its preparation. It has a yellowish color and a density of ·980, a little greater than ordinary beer, which is ·950. Its taste is pleasant and less bitter than the generality of malt liquors. It contains about 5·5 per cent. of alcohol, and 9 per cent. of extractive, yielding 7·7 per cent. of its weight ashes.—*The Sanitarian*, April, p. 153, from *Jour. d'Hygiène*, Jan. 10.

Supposed Colchicia in Beer.—Danneberg has continued his researches on this substance ("Am. Jour. Phar.," 1876, p. 467), and found that if the residue obtained by Stas' method be dissolved in water, the solution precipitated by tannin, and the precipitate decomposed by oxide of lead, dilute alcohol will take up a body which produces precipitates with the general reagents for alkaloids, but does *not* show the reaction of *colchicia* with nitric acid, which could be easily obtained if 1 colchicia was added to 50,000 parts of beer. Gelatin, according to Danneberg, is not present in beer; the reaction is due to constituents of hops and malt.—*Arch. d. Phar.*, March, 238–246.

Gillenin.—Dr. H. M. Wetherill, in repeating the experiments of W. B. Stanhope ("Amer. Jour. Phar.," 1856, p. 200), obtained the same uncrystallizable body which the latter named gillenin, and corroborates the statement that it is emetic in the dose of half a grain, repeated if necessary. No additional light is thrown upon the nature of gillenin by Dr. Wetherill's thesis as published in "Phila. Med. Times," April 14.

Huber's test for free mineral acids consists of a mixture of ammonium molybdate and ferrocyanide of potassium. If some of this yellowish liquid is added to a clear, colorless aqueous solution, a reddish-yellow to dark-brown coloration or turbidity is at once produced in the presence of traces of free mineral acids (sulphuric, muriatic, nitric, phosphoric, arsenic, sulphurous or phosphorous acid); the color disappears instantly on the addition of excess of alkali. It is evident that salts other than of the alkalies and earths must not be present. Boric and arsenious acids do not produce the reaction.—*Pharm. Zeitung*, No. 19.

A new reagent for potassium is proposed by Prof. Mohr. It is a saturated solution of the acid tartrates of potassium and of sodium, the latter converting neutral potassium salts into cream of tartar, which is in a short time precipitated, since the liquid is already a saturated solution of this salt.—*Phar. Zeitung*, No. 20.

Analyses of Hair Dyes.—The London "Lancet" had recently twenty-one "hair restorers," "hair dyes" analyzed. Fourteen consisted of a solution of lead with sulphur in suspension, and many were described as "perfectly harmless." They varied in price from 25 cents to $1.50 per bottle. Two consisted of a solution of lead salt in hyposulphite of sodium; one was a solution of lead, free from sulphur compounds; another contained two bottles, one filled with solution of ammonio-nitrate of silver, the other with pyrogallic acid.

The remaining three preparations analyzed were intended for lightening, instead of darkening the color of the hair. No substantial difference between these samples was detected. Each was found to contain a tolerably concentrated and slightly acidulated solution of peroxide of hydrogen. It is well known that this is the active agent in preparations of this kind. It can hardly be considered as poisonous, but its action on the hair is said to be injurious.—*Med. and Surg. Reporter*, Feb. 17.

Manufacture of Volatile Oils.—We find it stated, in a German trade circular, that a so-called *liquid oil of orris* is much in demand in Europe, and that it is prepared by distilling the root after the addition of oil of cedar wood.

The manufacture of *oil of bitter almonds* having considerably increased in France the seeds of apricots have been imported from Asia Minor in considerable quantities to be used in place of almonds.

So-called *Moravian oil of anise* consists almost entirely of the stearopten of oil of fennel.

Oenotaera biennis (which part?) has been used by Dr. N. S. Davis, of Chicago, in more than twenty cases of asthma, associated with chronic indigestion or gastric irritability, and in all of them with more or less benefit. It was given in the form of fluid extract in doses of 20 to 30 minims, repeated every 3 to 6 hours, as the case may require.—*Amer. Pract.*, Jan., p. 14–18.

The formation of ethylic salicylate in wine has been noticed by Dr. H. H. Endemann. The wine (from Southern New Jersey) had been mixed with 1 grain of

salicylic acid for twelve gallons of wine (about 1 to 48,000) to prevent after-fermentation. The formation of the ether is due to the nascent alcohol produced by subsequent fermentation, which was not prevented by the small quantity of salicylic acid. Neubauer recommends for this purpose 1 part of the acid to from 16,000 to 50,000 parts of wine, and in this case the maximum quantity should have been used. —*Amer. Chem.*, vii., 217.

Brasilin, the chromogen of Brazil wood, has been experimented with by C. Liebermann and O. Burg, who obtained its hydrates in compact rhombic crystals and white silky needles. Deprived of water, it has the composition $C_{16}H_{14}O_5$, being 1O less than hæmatoxylin ($C_{16}H_{14}O_6$); various substitution compounds were prepared, and their composition indicated the correctness of the formula. *Brasilein*, the coloring principle, is obtained in glistening scales, by adding to a hot solution of 3 parts brasilin in 300 water, 2 parts iodine dissolved in 20 parts of alcohol; its composition agrees with the formula $C_{16}H_{12}O_5$.—*Ber. d. chem. Ges.*, 1876, p. 1883.

The detection of fuchsin in wine and fruit juices has been the subject of much investigation in Europe. Prof. Flückiger proposes a simple qualitative test, depending upon the behavior to chlorine and bromine, by which the coloring matter of wine and raspberries is instantly destroyed, acquiring a light yellowish color. A solution of fuchsin, diluted to a very faint coloration, becomes very perceptibly darker and discolored on the addition of chlorine water, and the vapor of bromine produces a rich violet color, or violet floccules after some time; the darker coloration in both cases is lasting.—*Schweiz. Wochenschr. f. Phar.*, No. 11.

Prof. Schaer finds this darkening of color to be due to the presence of anilin or anilin salt; perfectly pure fuchsin acquires a pale yellow color under the circumstances mentioned above.—*Ibid.*, No. 13.

Niobe essence is crude methylo-benzoic ether, of an agreeable balsamic odor, and employed in perfumery. It is prepared by distilling a mixture of 1 part wood spirit, 2 p. benzoic acid and 2 p. oil of vitriol; the residue may be distilled with fresh portions of methylic alcohol twice or three times. The united distillates are treated and washed with water, then agitated with calcium chloride and rectified over dry oxide of lead. The same essence may be prepared from the calcium hippurate obtained from the urine of cattle, by distilling it with methylic alcohol and sulphuric acid.—*Apoth. Zeitung*, No. 12, from *Industrie-Blätter*.

MINUTES OF THE COLLEGE.

PHILADELPHIA, June 25th, 1877.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the Hall of the College, No. 145 North Tenth street.

Dillwyn Parrish, President, in the chair. Nineteen members present.

The minutes of the last meeting were read and adopted.

The minutes of the Board of Trustees for the last three months were also read for information, and on motion adopted.

These minutes call attention to the report of a committee appointed by the Board to take into consideration the expediency of relinquishing the annual dues of such persons as shall have been members twenty-five years, and this report the Board directed to be referred to the College for its action thereon.

The matter was taken up by the College, and the report was ordered to be read. After a short discussion, the subject was postponed under the rules for further consideration at the next stated meeting of the College.

A letter from George Y. Shoemaker, resigning his right of membership in the College, was read. On motion, the resignation was accepted.

This being the time for an election of five delegates to represent the College at the annual meeting of the American Pharmaceutical Association, to be held in Toronto, Canada, on the 4th of September next, and also for three delegates to attend the conference of Schools of Pharmacy, at the same time and place, a ballot was ordered, and the tellers reported the following gentlemen elected, viz.:

Delegates to the American Pharmaceutical Association.

Dr. Wilson H. Pile. Dr. Adolph W. Miller. George W. Kennedy.
William McIntyre Albert P. Brown.

Delegates to the Conference of Schools of Pharmacy.

Prof. John M. Maisch. Prof. Jos. P. Remington. Charles Bullock.

On motion of Thos. S. Wiegand, the following resolution was adopted:

Resolved, That this College nominate and appoint a committee of eighteen members for the purpose of revising the United States Pharmacopœia. with a view of presenting their labors to the Convention meeting in Washington, in May, 1880

Mr. Wiegand advocated early action in the matter, as the committee would have much to attend to.

Prof. Maisch coincided with the views of Mr. Wiegand, and stated that the Philadelphia County Medical Society had already appointed a committee to take action in the matter. He moved that the committee be appointed by the President, Vice Presidents and Secretary, and announced at the next stated meeting of the College, which motion was adopted.

Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Maryland College of Pharmacy.—At the monthly meeting held July 12th, the regular election of officers was had, resulting in the re-election of the former incumbents, as follows: President, Jos. Roberts; Secretary, Edwin Eareckson; Treasurer, Wm. E. Thornton; one of Board of Examiners, Louis Dohme.

Delegates to represent the College in the American Pharmaceutical Association, September, 1877—Louis Dohme, J. F. Hancock, Edwin Eareckson, F. Hassencamp, Joseph Roberts; Delegates to Conference of Schools of Pharmacy—Wm. S. Thompson, J. Faris Moore, N. H. Jennings.

Louisville College of Pharmacy.—At the Pharmaceutical Meeting held June 7, President Diehl in the chair, G. E. Bell was elected Registrar. An interesting paper on Spirit of Nitrous Ether (see July number, p. 352), was read by Prof. Diehl.

Attention was then called to the introduction of semi-proprietary medicines, by their manufacturers, to the notice of the medical profession, and to the burden imposed on the pharmacists through physicians, who make use of such compounds. The various commercial preparations of malt, different kinds of pills and granular effervescent preparations were also alluded to, and in regard to the latter it was suggested that perhaps a simple effervescent powder might be prepared which could be medicated at the pleasure of the physician at the time of dispensing. In connection with this subject, it was moved and carried that a committee on unofficinal formulas be appointed, which was constituted as follows: Dr. V. Davis, Prof. E. Scheffer, W. H. Garland, H. H. Rademaker and G. E. Bell.

Kentucky State Pharmaceutical Association.—We are pleased to be able to announce the organization of this body, which took place in the city of Frankfort on July 11. The new Association starts with a membership of 43, representing 16 cities and towns; a very auspicious beginning. The following officers were elected: President *pro tem.*, W. H. Averill, Frankfort; Secretary, W. G. White, Richmond; Treasurer, Peter Nodler, Covington.

The following committees were appointed and instructed to report at a meeting to be held in the city of Covington, on the first Wednesday of May, 1878: On Constitution and By-Laws—J. J. Frost, Peter Nodler, W. M. Stout, W. T. Courtney and W. M. Owen; on Notes and Queries—Jefferson Oxley, J. J. Frost and John Colgan; on Business for Next Meeting—G. A. Zwick, E. C. Reiss and Vincent Davis.

The Chairman and Secretary were by resolution directed to correspond with the druggists of the State, asking their co-operation in the movement, and to send circulars and blank applications to at least one druggist in each town of the State, requesting him to aid the Association in obtaining members.

By resolution, three dollars was fixed upon as the fee of admission into the Association, the amount to be sent with application for membership.

The Nova Scotia Pharmaceutical Society has recently been incorporated and empowered to appoint three, and the Provincial Government two Examiners, who together are to examine candidates for registration. All persons who, at the time of the passing of the Act, were actually in business as chemists and druggists, and all who at that time had served at least seven years at the business, are entitled to registration, on payment of a fee of four dollars, which must be continued yearly. Graduates of other Colleges are exempt from examination. The examination fee

is five dollars, and if successful, another fee of five dollars is to be paid, which entitles the candidate to registration, as a member of the Society. The Executive Council consists of twelve members and the following officers: H. A. Taylor, President; H. L. Atkins, Vice-President; A. Forsyth, Treasurer; W. H. Webb, Secretary, and J. H. Angiven, Registrar.

The German Apothecaries' Society will hold its sixth annual meeting at Leipzig, September 4 to 7, at which time a pharmaceutical exhibition will take place of new preparations, natural products, apparatus and utensils from the domain of pharmacy, physics, botany and hygiene.

EDITORIAL DEPARTMENT.

The American Pharmaceutical Association.—Before our next issue will reach many of our subscribers, the members of the American Pharmaceutical Association will be on their way to attend the twenty-fifth annual meeting, at Toronto, Canada. The general rendezvous of most of those intending to be present will be at Niagara Falls, where the *Cataract House* will be the headquarters, and where tickets for some localities of interest will be obtainable at lower prices, at the store of Hiram E. Griffith, M.A.P.A. Many members from the Atlantic, Southern and Western States will meet on the way to or at Watkins, on the evening of Wednesday, August 29, where the headquarters will be at the *Glen Mountain House*, already known to a large party of the Association, which stopped there in 1872. The exploration of Watkins Glen, Havana Glen and Hector Falls will occupy Thursday and Friday. The programme for Saturday will include a sail on Seneca Lake from its southern end at Watkins to its northern termination at Geneva, and the journey to Niagara Falls, where Sunday and Monday may be spent. Leaving Tuesday forenoon, by way of Lewiston and steamer on Lake Ontario, Toronto will be reached at 1.30 P. M., giving ample time for dinner and to attend the opening meeting at 3 o'clock. The headquarters will be at the *Rossin House*, and the sessions will be held at the City Council Chamber. The three hotels named will furnish first-class accommodations at reduced rates to the members and their families.

The contemplated pharmaceutical exhibition, it is earnestly hoped, will be well supplied from Canadian exhibitors as well as with articles which are of the *growth*, produce or manufacture of the United States, and only such are recommended to be sent. They should be addressed to the local Secretary, Mr. Henry J. Rose, and will then be admitted in bond and exhibited, and if not sold, may re-enter the United States *duty free*. Under existing regulations, such re-entry is effected with the least trouble at the port whence they were shipped (Suspension Bridge for instance), and the necessary formalities may be attended to by the person in charge of such goods. The local secretary should be notified on or before August 15 of the space required.

Members living on the lines of the Great Western or Grand Trunk Railways may obtain round trip tickets to Toronto and back at one and one-third ($1\frac{1}{3}$) fare.

After the close of the meeting an excursion into the country is contemplated, occupying one or two days, and which will afford opportunity for fishing and other recreations.

On the home trip the members will scatter; but the Secretary has been informed that some contemplate to return via Montreal, the White Mountains and Portland or Boston; others via Montreal, Lake Champlain and Lake George to Albany; others via Alexandria Bay (Thousand Isles) and Trenton Falls to Albany, and another party will return to Suspension Bridge and via New York Central Railroad to Albany, thence by the Day Line of steamers down the Hudson to New York. The latter party can obtain round trip tickets between Suspension Bridge and Toronto at two dollars. Excursion tickets to and via Niagara Falls, covering either route, are issued by most railroads.

Physicians and Pharmacists.—On various occasions we have dwelled upon the necessity of an amicable settlement of any differences of opinion or causes of complaint between the two professions, and but recently (May number, p. 269) we have referred to the commendable action in such cases of the physicians and the pharmacists of Antwerp and other Belgian cities, which is well worthy of imitation in this country. If such a spirit of conciliation had existed, the controversy between the two professions in Alleghany county, Md., would not have assumed its present shape, and much annoyance and ill-feeling would have been prevented. We learn that the Medical Society of that county has passed a resolution, declaring "that it is the duty of the members of this Society to withdraw their prescriptions from any druggist who puts up any nostrums, or who prescribes or recommends any patent or other medicines for any class of cases, whether grave or trivial." To this the druggists have replied by a resolution in which they will, "in the alleviation of suffering amidst all classes, pursue, as heretofore, the legitimate mode of conducting our own affairs."

There are just causes for complaints by both sides in many localities, both city and country. It is a cheap virtue to raise an outcry against the sale of proprietary medicines; but the manufacturers thereof know full well that the readiest way to introduce them and insure an extensive sale throughout the country is through the physicians, a large number of whom are easily persuaded to prescribe or use in their practice almost anything that comes to them under a plausible garb, from Warburg's Tincture and the various frauds, which, though wholly or mainly composed of cinchonia, sail under different colors, down to the active principles of the brain or of the gizzard. Such semi-proprietary medicines of a pretended composition, but which can be manufactured only by the proprietor of the secret, we consider to be far more dangerous than those barefaced impostures, which can be kept afloat only by the most liberal advertising in the secular and religious papers.

The so-called counter prescribing is another favorite hobby with some physicians who will not or cannot see the necessity of having recognized simple remedies for ordinary ailments. If such were agreed upon by the medical and pharmaceutical professions of different localities, such action would at once strike a blow at many nostrums of high and low degree, which are principally used in trivial cases. And

it is just in such trivial cases, like toothache, slight cough and the like, that patients will use domestic remedies before they apply to the dentist or the physician. Such counter prescribing it has been found impossible to suppress, even in those European countries where the whole power of the State could be brought to crush an evil, if evil it be; and it is our firm opinion that resolutions or threats, from whatever source they may emanate, will fare no better. Let the legitimate wants of the public be studied and recognized, and let both professions act harmoniously together, and the removal of a great amount of complaint will be the result.

If, on the other hand, injudicious quarrelling is preferred, the effect upon the public will be different from that expected by either party. A case in point is the controversy alluded to above, which is ridiculed by the "Baltimore Gazette" of July 10th in an article headed "Pill and Liberty," and which closes as follows:

"Meantime, it is fearful to consider the condition of the lungs, intestines, kidneys, diaphragms, livers, colons and knee-pans of the good people of Cumberland. Any disease, 'grave or trivial,' must be borne patiently until the fight is over. It is possible that some compromise might be made, for many things which were once nostrums are now the property of the medical profession—Hoffmann's anodyne, Dover's powders, and a hundred similar things. This might furnish the basis of negotiations, but until the battle is ended colics and catarrhs must be endured. There is no doubt that a learned prescription in the Latin of the period does powerfully influence the bucolic mind. A doctor once gave a nurse a very learned description of the malady of the patient, who received it deeply impressed, and confided to her friends that the patient must die, because the doctor said 'he had lost all the Latin part of his bowels.' There can be no doubt that the prescription: ℞ Tinct. camph. comp. ex. hydropipy, 3 oz., must exert an effect beyond a simple 'blood purifier,' although possibly composed of the same ingredients. The druggists, however, have the side of free pills and liberty. Should the doctors subdue them they may advance next upon the venders of stimuli, and no man would be able to assuage the pangs of thirst unless he were armed with a legitimate prescription: ℞ Foliæ menthæ, sacch. ab., 1 oz.; spiriti vini otardi, 3 oz.; glacis pulv., quant. suf., et shakete violenter et suckite dulciter cum strawum. Shall this be? Never! The druggists have in their keeping the cause of liberty. The eyes of all Europe are upon them."

Dr. Heinrich Robert Gœppert will celebrate the fiftieth anniversary as academical teacher on September 27 next. At the date mentioned in the year 1827, he habilitated as private lecturer (Privat-Docent) at the University of Breslau, where he has successfully labored ever since. His former pupils intend, as a mark of veneration, to present him with an album containing their photographs. He is still actively engaged in the pursuit of his favorite science, botany.

Achlys triphylla, D. C.—A short time ago a correspondent sent us some specimens of a plant growing in *Washington Territory*. Having mislaid the letter we are unable to communicate directly with him, and therefore state in this place that the above is the botanical name of the plant. Should the plant be employed medicinally or otherwise, we would thank our correspondent for further information.

The Sale of Benzin and Naphtha.—We give room to the following communication advocating a very plain precautionary measure when selling very inflammable liquids. The general adoption of such a measure by druggists and apothecaries would seem not to be very difficult; but what precautions may be expected from grocers and other dealers who never label any article sold by them, yet dispose of much larger quantities of benzin than is done by the drug trade?

Editor American Journal Pharmacy:

In the light of the recent terrible explosion occurring in our city and resulting in the loss of two lives through the ignorance of the inflammable nature of benzin, is it not well in the common interest of humanity that the attention of the drug trade should be called to the precautions to be observed in dispensing this substance in common with all other light hydrocarbons? Not to dwell too long on the case in point, the facts are these: A gentleman living in the upper section of our city purchased five gallons of benzin, and taking it home, emptied it into a watering pot, such as is used for horticultural purposes, and carefully (?) sprinkled the carpets, furniture, etc, of the parlor, the object being to prevent or destroy the moth.[1] Can we conceive of anything more hazardous? A draft of air carrying the vapor of the volatile liquid through the doorways left open by the servant, communicated it with the fire of the kitchen, and the result is the death of two persons in the most intense agony. It is obviously a case of "no one to blame."

Let it not be thought that this is an exception. A few weeks ago we remember a similar accident in a neighboring city, where several gallons of this liquid was sprinkled about the room by gas light. Need we chronicle the result, or say that the woman whose interest in the ravages of the pestilent moth, occasioned her death, should have been more careful! Let any one of our pharmacists inquire of his friends and acquaintances, or his customers, and he will be astounded at the prevalence of this custom, and the small number of accidents, considering the most utter indifference to and ignorance of the inflammable and explosive character of benzin, naphtha and similar liquids.

If there is a remedy for this, it becomes us, as professional men, conservators of the public health, as in a measure we are, to provide it; and we would therefore strongly suggest that whenever a liquid of this nature is dispensed or sold, *a label shall invariably accompany it, printed in plain, bold type, warning all purchasers distinctly and imperatively of the danger incident to its use.*

We may in this connection note a practice becoming very prevalent of late, which is that of young women purchasing a pint or more of benzin or naphtha for the purpose of cleaning kid gloves. We may add that this practice is more frequent among the poorer classes, and that their custom is, of necessity, very generally to do work of this kind in the evenings after their return from their daily employment. How many poor girls passing unscathed through the mills and factories and laboratories covet death innocently and ignorantly through the necessity of "making both ends meet" on a starvation salary, we can never know; but we repeat that it is only our duty—nothing more nor less—that we should guard them and the public in so far as possible against the occurrence of similar accidents.

Since writing the above we have heard of a case illustrating the same, which, not to trespass longer than the importance of the subject deserves, we will narrate: A young woman employed in an Eighth street store was a few evenings since cleaning her gloves with naphtha, by gas light. Having them on her hands, the naphtha caught fire, and the result was that her hands were so severely burned as to preclude the use of them for several weeks, with a possibility of crippling them for life. Do we need more warning?

RICH. V. MATTISON.

Philadelphia, June 9, 1877.

The sale of arsenic is restricted in most States in the Union, only in so far as it must be made to known adults, and properly registered in the *poison book*; if the package is also labeled with the name of the article and the word "poison," the legal responsibility of the dealer ceases. Recently a case of fatal poisoning occurred in this city, a young lady taking a quantity of arsenic instead of magnesia, which was done up in a similar paper and properly labeled. Although such cases of carelessness are of rare occurrence, yet even these might be avoided if the arsenic was colored, so that it could not be mistaken for sugar or other harmless substances. The custom of many pharmacists to add to rat's bane a small quantity of charcoal is a good one, but a more striking color is produced by the addition to arsenic of one per cent. each of ferrous sulphate and potassium ferrocyanide, both in the state of fine powder, as recommended in our last volume, page 217.

[1] At the Coroner's investigation it was testified that the benzin was purchased at the store of a dealer in spirits and oils (not from a druggist), and that the can was labeled *parlor oil, non-explosive.* The jury appended to their verdict a "desire to call the attention of the proper authorities to the sale of the dangerous explosive which is sold as safe and harmless;" but they did not state whether they considered anybody to blame.—EDITOR.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, etc. By Rob. Bentley, F. L. S., and Henry Trimen, M. B., F. L. S. Philadelphia: Lindsay & Blakiston.

Parts 20 and 21—Part 19 has not been received yet—are of particular interest to the American pharmacist and physician, containing, as they do, full accounts of not less than six North American medicinal plants, and, in addition thereto, of several others indigenous or cultivated in the tropical parts of the Western hemisphere. The following plants are described and figured: Aloe vulgaris, Areca Catechu (betel-nut palm), Arenga saccharifera (sago palm), Boswellia Carterii (frankincense tree), Chenopodium anthelminticum, Eupatorium perfoliatum, Ferula sumbul, Hedeoma pulegioides, Monarda punctata, Pimenta (Myrcia) acris, Pim. officinalis, Plantago ispaghula (spogel seeds of India), Sambucus canadensis, Simaruba amana and Xanthorhiza apiifolia.

Recherches pour servir à l'histoire chimique de la racine de gentiane; présence d'un tannin. Thèse présentée et soutenue à l'école supérieure de pharmacie de Montpellier le 18 Mai, 1877. Par Jules Ville. Montpellier. 4to, pp. 56.

Researches on the Chemical History of Gentian Root, regarding the Presence of a Tannin.

These researches were prompted by the discussion last year between E. L. Patch and J. M. Maisch in relation to the same subject. The author arrives at the same conclusion previously maintained and proven in this country, that the dark coloration or even precipitation produced by ferric salts in liquid preparations of gentian is due to gentianic (gentisic) acid; but he regards this principle as a kind of tannin and proposes for it the name of *gentianotannic acid*. In his review he has scarcely done justice to the observations made by Patch and Maisch, neither of whom worked with the compound tincture of gentian, but with the simple tincture and the infusion. That these are precipitated by gelatin has been noticed before, but that this precipitate after washing with water retains none of the gentianic acid is ignored by the author. His most important experiment for sustaining his position was performed by mixing 20 grams of a solution of gentian with 20 grams of fresh, well-scraped and cut skin, of which the hairs were shaved off. The mixture was tested from time to time with ferric chloride, the coloration becoming less intense, and after eight weeks ceased altogether. Bitter orange peel treated in the same manner yielded the same coloration at the expiration of this time as at the beginning. In attempting to observe the effect of gentian in making leather, the author was satisfied with the properly prepared skin presenting *des traces très-apparentes de tannage* after a contact of one month. The author refers also to the investigation of gentisic acid by Hlasiwetz and Habermann ("Am. Jour. Phar.," 1875, p. 207), and points to the similar decomposition of moritannic acid; but it should be borne in mind that protocatechuic acid (the isomer of gentisinic acid) as well as phloroglucin are produced from numerous substances which are not tannins. The differ-

ence between physiological and pathological tannins, as assumed by R. Wagner (1866) and referred to by the author, has, we think, been completely disproven by Dragendorff.

The position of the author, though it may be sustained by future investigations, has, in our opinion, not been proven.

We may state yet that, as far as we are aware, gentian and ferric salts are, in the United States, not considered incompatible, on the contrary, are frequently prescribed together, and a permanent liquid form, free from inky appearance and taste, the ferrated elixir of gentian, has been used here for more than ten years.

Report of the State Board of Pharmacy made to the General Assembly of Rhode Island. 1877.

During the year 1876 the Board examined and passed seven "assistant pharmacists," and of eighteen applicants to become "registered pharmacists" ten were granted registration on the first, two on a second and two on a third examination, and the remainder were refused.

Proceedings of the Georgia Pharmaceutical Association at the Second Annual Meeting, held in Atlanta, Ga., April, 1877. Also, the Constitution, By-Laws and Roll of Members. Atlanta. 8vo, pp. 90.

The little volume before us speaks well for the Association whose proceedings are recorded therein. Besides the addresses of President L. W. Hunt and Messrs. W. A. Taylor and T. A. Cheatham, we find an address by Mr. Th. Schumann, delivered at the first annual meeting, in which the author advocates proper pharmaceutical education, argues in favor of the pharmacist to be educated by the pharmacist, and urges combined exertion with the view of taking care of our interests in legislation.

Of the papers read at the second meeting, one by Mr. Th. Schumann compares the various pharmacy laws and proposes some amendments to the Georgia law, while another dwells on the effect of the patent medicine trade and urges as the only effective remedy: "Elevate the profession—educate the young pharmacists well—educate them to the standard." W. B. Addington describes his method of making phosphorus pills by dissolving the phosphorus in carbon bisulphide before incorporating it. O. Butler pronounces in favor of coated over compressed pills, and claims sugar as a coating superior to gelatin. P. J. Schumann discusses the best means for detecting the various adulterations of wax, and T. A. Cheatham makes some remarks on the so-called bromo-chloralum without solving the question in regard to its asserted superiority as a disinfectant over aluminium chloride. As an evidence of the commendable spirit of the Georgia Association, we cannot refrain to make room for the following protest, which was adopted and presented to Hon. Cinc. Peeples, Judge of the Superior Court of Fulton county, Ga.:

"Considering that Pharmacy is a science for itself—an independent branch of the natural sciences; considerng that Pharmacy has nothing to do with the different theories and schools of medicine; that a pharmacist ought to be able to prepare medicines of the mineral or vegetable kingdom in the proper manner, according to

the rules laid down by the science of pharmacy, be that medicine prescribed by a physician of one or the other school, be it administered to a patient according to either theory in medicine; considering that a good pharmaceutical education can only be obtained through well-educated pharmacists, that only well-experienced pharmacists, who devote their time and power to study in their own profession, can make good teachers in their profession; that a physician cannot be, as a rule, and, according to the nature of the case, a good pharmacist, much less a desirable teacher of pharmacy; considering that in all civilized countries the instruction and education of pharmacists are left to pharmacists or to such persons who make different branches of pharmacy, chemistry, botany, pharmaceutical materia medica, toxicology a special study; considering that an imperfectly established school of pharmacy will only retard the establishment of a good institution of this kind—will do more harm than good by granting degrees to incompetently educated persons; considering that there are good schools of pharmacy in the Northern and Southern States, and the establishment of imperfect schools would be a disgrace to the State and no advantage, and that any school of pharmacy connected with, and being an appendix to, any medical college can only result in neglecting the education of pharmacists and in granting licenses to incompetent persons; considering that it would be very difficult to find a physician who would be able to give effective lectures and good instruction in pharmacy, chemistry, botany, toxicology and other branches of pharmacy:

"The undersigned members of the Pharmaceutical Association of the State of Georgia do herewith protest against the establishment of a school of pharmacy connected with and appended to any medical college of any denomination, and especially connected with the Georgia Eclectic Medical College, and petition the Court to strike from its charter anything relating to a school of pharmacy or to diplomas in pharmacy."

The Association of American Medical Colleges; History of its Organization, its Constitution, By-Laws, Articles of Confederation and List of Members. Detroit, 1877. Pp. 26.

A convention of representatives of American medical colleges was held at Philadelphia in June, 1876, at which several questions relating to medical education were discussed. A permanent organization was effected at Chicago in June last and was at once joined by twenty-three medical colleges. The objects are "the advancement of medical education in the United States, and the establishment of a common policy among medical colleges in the most important matters of college management." In its objects and organizations the association is similar to the "Conference of Schools of Pharmacy," which held its initiatory meeting at Baltimore in 1870, and was permanently organized at St. Louis in 1871.

Remarks on Sulphate of Quinia. By Alexander H. Jones. 8vo, pp. 16.

The pamphlet is intended to meet the arguments and often misrepresentations of those who would have Congress repeal the duty of 20 per cent. now collected from quinia of foreign manufacture.

Addresses of the Special Committee of the Chamber of Commerce of the State of New York on Customs Revenue Reform; delivered June 4th, 1877, at the Rooms of the Chamber of Commerce of the State of New York, before the Commission appointed to Investigate the New York Custom House. Pp. 72.

The title of the pamphlet explains its aims, to promote reforms in the customs service of the country.

Pettingill's Newspaper Directory and Advertisers' Handbook for 1877; comprising a complete List of the Newspapers and other Periodicals published in the United States and British America. New York: S. M. Pettengill & Co. 8vo, pp. 334. Price, $1.

The directory gives information such as is desirable to advertisers about nearly 8,600 periodicals. Notwithstanding the evident care bestowed upon the compilation, some of the scientific journals appear to have escaped the editor's eyes.

Notes on the History and Climate of New Mexico. By Dr. Thos. A. McParlin, Surgeon U. S. A. Washington, 1877. 8vo, pp. 28.

This very interesting report was communicated by the Surgeon-General, U. S. Army, and appeared in the Smithsonian Report for 1876.

On the Surgical Complications and Sequels of the Continued Fevers. By Wm. W. Keen, M. D., of Philadelphia. Washington: Smithsonian Institution, 1877. 8vo, pp. 68. Price, 25 cents.

This is the fifth of the Toner lectures, instituted to encourage the discovery of new truths for the advancement of medicine. It was delivered February 17, 1876.

History of a Case of Recurring Sarcomatous Tumor of the Orbit in a Child, extirpated for the Third Time, and ultimately Causing the Death of the Patient. By Thos. Hay, M. D., of Philadelphia. Lindsay & Blakiston, 1877. Price, 50 cents.

A reprint from the report of the Fifth International Ophthalmological Congress, held in New York September, 1876, and illustrated by three lithographic plates.

On the Diagnosis of Urethral Stricture by Bulbous Bougies, with Illustrated Cases. By J. Wm. White, M. D, Lecturer on Venereal Diseases in the University of Pennsylvania. Philadelphia: J. B. Lippincott & Co.

A reprint from the Philadelphia "Medical Times" of May 26th, 1877.

A Case of Abdominal Pregnancy Treated by Laparotomy. By T. Gaillard Thomas, M. D., New York.

Reprint from "Gynæcological Transactions," 1876.

The Prophylactic Treatment of Placenta prævia. By Prof. T. Gaillard Thomas, M. D.

Reprint from the "American Practitioner," May, 1877.

Transactions of the Medical and Chirurgical Faculty of Maryland at its Seventy-ninth Annual Session, held at Baltimore, Md, April, 1877. Pp. 190.